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Vol. XXII, No. 9 **SEPTEMBER, 1933**

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 82nd ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN WASHINGTON, D. C.

The 1934 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Washington.

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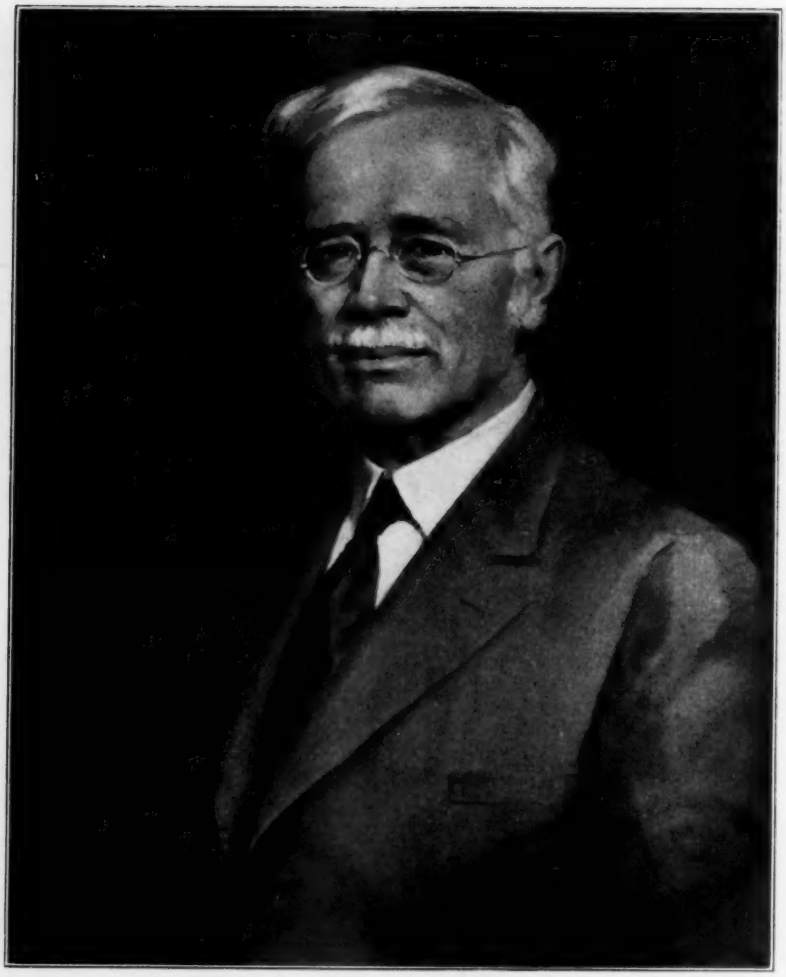
Group Picture of Members of AMERICAN PHARMACEUTICAL ASSOCIATION, Taken at the Home of Professor and Mrs. Edward Kremers, "The Highlands," following a Lawn Party, Thursday, August 31st.

The home of the hosts is beautifully situated on an elevation, which affords a view across the valley and another over Lake Mendota with the Capitol in the foreground, presenting charming pictures in which nature had a large part. Here, on an earlier occasion, as part of the entertainment of Plant Science Seminar, Dr. C. E. Brown, Curator of the Historical Museum, entertained the visitors with a Campfire Talk.

Near the center of the group, standing in the front row are Dr. and Mrs. Kremers; seated in front of them, to the left, are Local Secretary and Mrs. Emerson D. Stanley; on the right, Secretary E. F. Kelly and President W. Bruce Philip. The picture was taken shortly before the setting of the sun, but is remarkably clear and the faces will be recognized by the readers.



EDWARD KREMERS.

Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1933–1934.

The half-tone is from a photograph of a portrait by Merton Grenhagen, a Wisconsin artist. The portrait was presented to the University by former students, Professor Nellie Wakeman making the presentation and Dean George Sellery formally accepted the painting. (Hotel Loraine, August 30, 1933.)

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXII SEPTEMBER, 1933 No. 9

THE HONORARY PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1933–1934.

Edward Kremers, son of Gerhard and Elise (Kamper) Kremers, was born in Milwaukee, Wis., February 23, 1865. After serving an apprenticeship, he entered the Philadelphia College of Pharmacy (1884) and, returning to Madison, earned his B.S. degree at the University of Wisconsin (1888). Under the leadership of the late Dr. Frederick B. Power he began his researches on volatile oils and photochemistry: "this inspirational influence" prompted him to carry on his studies under Dr. Wallach at the University of Bonn, then the outstanding authority in terpene chemistry, and when the latter left this institution to take up duties at the University of Göttingen, Edward Kremers, with other students, followed Dr. Wallach to his new charge. Here, in 1890, our honored member was awarded the Ph.D. degree, his dissertation being on "The Isomerism within the Terpene Group," which subject was the foundation of many later researches.

Dr. Kremers, on invitation of Dr. Power, returned to the University of Wisconsin as a member of the pharmaceutical faculty; in 1892, he was elected to the chair of pharmaceutical chemistry, and when Dr. Power resigned to take up other work, Dr. Kremers was elected his successor, and has rendered faithful and productive service during more than forty years. During this period the Wisconsin Pharmaceutical Experiment Station was founded and promoted and, through his efforts, practical pharmacognosy has found a permanent place in the pharmaceutical curriculum and "the garden has been made an adjunct to the textbook and the lecture room." He established the first graduate work in America leading to the Ph.D. degree for plant chemistry and for pharmacy.

Dr. Kremers has contributed largely to pharmaceutical, chemical and historical literature; listing the titles of his many contributions would extend the limits of this incomplete sketch; his historical articles present a fund of information. "American Men of Science" gives a hurried reference to some of his investigations: "Chemistry of volatile oils and their constituents; sesquiterpenes and derivatives; quinhydrones as plant pigments; bibliography of the chemical constituents of volatile oils; classification and occurrence of the constituents of vola-

tile oils according to modern principles; the *Monardas*, a phytochemical study; classification of carbon compounds." The PROCEEDINGS and JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION report many of his pharmaceutical researches. He has been associated in an editorial capacity with several publications, notably the *Pharmaceutical Review* and *Pharmaceutical Archives*. He was co-editor of the "National Standard Dispensatory," and is the author of the English edition of "The Volatile Oils"—Gildermeister-Hoffmann-Kremers.

Oswald Schreiner, writes of our distinguished member in *Industrial and Engineering Chemistry* relative to his association with the young men and women who studied under him and were privileged to enjoy the hospitalities of the home of Dr. and Mrs. Kremers at "Highlands," on Mendota's lovely hills: "The undergraduate became the devoted disciple in his graduate years, as in these delightful gatherings Dr. Kremers' enthusiasm and devotion to science were imparted with inspiration to his student guests; his lectures at the University were replete with the learning of alchemists, sage and scientist, and crowded with facts, but these quiet social hours revealed the true greatness and heart of the man and are counted among the treasured hours of memory by hundreds of his old students." Those who have visited this beautiful home can understand the influence on the students of this social contact as inspiring, for he is a wise and helpful counselor.

Dr. Kremers was a member of the Revision Committee of the United States Pharmacopœia, 1900–1910, and his researches have been helpful in the revision of the Standards and to the authors of textbooks.

In 1887, Edward Kremers became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION; in 1897–1898, he was chairman of the Scientific Section; when the Committee on Historical Pharmacy was founded he was elected historian and served in that capacity after the Committee became a Section of the ASSOCIATION, until 1912. He was president of the American Conference of Pharmaceutical Faculties in 1902; of the Wisconsin Pharmaceutical Association in 1930. He was awarded the Ebert Prize in 1887 and again in 1900, and received the Remington Honor Medal in 1930.

The Honorary President is an activating influence in historical research and has contributed largely to the Wisconsin Society; he impresses the members with pharmacy's part in the development of the state—the Historical Drug Store is an outstanding example. His collection of books and historical material evidences an acquaintance with pharmaceutical history that reveals the mind of a systematic collector and the ability to portray history, not only in his writings but by assembling facts of history in his selections.

Dr. Kremers is a member, honorary and active, of a number of societies in Europe and America, among them, Societe d'Historie de la Pharmacie, Gesellschaft für Geschichte der Pharmazie, American Chemical Society, Society for the Advancement of Science, Wisconsin Academy of Science and Letters, honorary member of the German Pharmaceutical Society, etc. He received the degree of Sc.D. *honoris causa* from the University of Michigan.

July 6, 1892, Edward Kremers and Miss Laura Haase, of Milwaukee, were married; three children are living, two daughters and a son. The latter is Dr. Roland E. Kremers, of Battle Creek, Mich., a member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

PHARMACY WEEK.

"MEDICINE is as old as the human race, as old as the necessity for the removal of disease." There is much for the pharmacist in this thought as credited to Haeser in relation to the Pharmacy Week movement, for pharmacy has run a parallel course with the history of mankind and that of the profession of medicine. Pharmacy Week does not have for its purpose that of a comprehensive publicity stunt or a ballyhoo proposition.

There is a deep significance to Pharmacy Week—the monument as erected by the late Dr. Robert J. Ruth. In the procession of mankind down through the ages pharmacy has occupied an important rôle and has contributed much to the relief of those suffering with bodily ailments. The dust-laden archives of our time-honored profession are filled with glorious achievements on the part of pharmacists. Let us pause for a moment or two and reflect on the thought that three of the greatest of all gifts tendered mankind represent the labors of pharmacists. These three great gifts are Morphine, Quinine and Iodine, as respectively discovered by Sertürner, Pelletier and Caventou, and Courtois.

Pharmacy has much to be proud of and we should do everything within our power to safeguard this truly valuable heritage at all times. In order to safeguard this heritage we must at all times conduct ourselves as pharmacists, for it must be remembered that the character of a pharmacist is best perhaps defined as "the sum-total of his or her daily conduct."

In presenting the story of Pharmacy to the world at large let us see to it that the sum-total of our daily activities is of such a character as to be an honor and a credit to the profession.

In the presentation of a professional window display let us see to it that the institution in general and more specifically, that of the prescription room, are in keeping with these thoughts. One should begin with the prescription department, to place same in order before proceeding to a window display for according to an old German saying (when translated), "In the eyes one sees the heart."

Let us keep the spirit of the fine art of the Apothecary aglow with the fine traditions of this noble heritage with which we of the present generation have been entrusted. It is first necessary to see to it that one's attitude is correct. Are you proud of the fact that you have been privileged to become a member of this time-honored fraternity?

Pharmacy Week affords the retail pharmacist and all others associated with the profession an excellent opportunity of going forth to preach this gospel of romance and glorious achievements. The science of chemistry as well as the profession of medicine has been quite active in this connection. The many thousands of window display spaces at the command of pharmacy afford us an unusual opportunity of presenting our accomplishments in a forceful manner. A professional window display in addition to being attractive should carry with it a deep significance. In connection with window displays it is best to select one subject and stick

to it throughout. Don't confuse the mind of the public with a heterogeneous collection of this and that which is lacking in significance.

Make arrangements now to appear before the various organizations in your community during Pharmacy Week. Human interest-appeal stories can be obtained free of charge by addressing the National Pharmacy Week Executive Committee at 161 Sixth Ave., N. Y.—ANTON HOGSTAD, JR.

TELL ABOUT YOUR SERVICE AND ABOUT YOUR WARES BUT NOT IN THE SAME MESSAGE.

IN A recent issue of *Review of Reviews* Roger W. Babson discusses the value of the Show Window in an article entitled "Put Your Wares in the Window." He contends that buyers must be persuaded to purchase by persistent publicity and salesmanship.

He holds that intrinsic worth of merchandise is essential but not enough; goods must be sold to the prospective buyer by acquainting him or her with the value of them and this requires intelligent salesmanship. Mr. Babson argues that the public buys best when merchandise is brought effectively to its attention through advertising and when the merits of the goods are carefully explained by an alert salesman to a prospective customer.

In a related way publicity for pharmacy is brought to the attention of the public by a window that tells of applied pharmacy, the detail of manufacturing, the sources of supply—impressing the need of accuracy.

The visitors at the Century of Progress prove that the public is deeply interested in the service rendered by pharmacists; there need be no further question regarding the value to be derived from telling the story of pharmacy, but such a window must be kept free from merchandise; any attempt to display professional service with unrelated sales items destroys the effectiveness of the display and does injury to the store.

Instructive exhibits were on display at the Madison meeting, prepared by Chairman E. Fullerton Cook, of the Revision Committee of the U. S. Pharmacopœia, Chairman E. N. Gathercoal, of the National Formulary, and Chairman J. Leon Lascoff, of the Pharmaceutical Recipe Book.

COMPLETION OF RETAILERS' CODE DELAYED.

THE Code, as far as pharmacists are concerned, remains the same and there is assurance that there will be no change. The Master Code for the retail stores is delayed, largely because General Johnson has not reviewed it and the Central Statistical Board is studying prices in connection with wages. While druggists will have a separate code, they are interested in the retailers' code as it affects other sales in the drug store. Price-fixing and price maintenance, as defined in the proposed code for the retail trade, may be changed before the code is perfected and accepted. It is needless to comment at this time when there is still uncertainty, nor present views that may not be accepted and confuse rather than prove helpful. However, changed provisions are embodied in this comment.

The purpose of the *Stop-Loss Provisions* of Section one are intended to check "predatory price-cutting and minimize retail operating losses resulting therefrom, and in order to assure that the retailer shall be at least partially compensated for the service he renders the consumer; on and after the effective date of this code no retailer shall offer for sale, sell, exchange or give away any merchandise, except as provided hereinafter, below a minimum price, which shall be the wholesale delivered price as hereinafter defined with the addition of a charge of ten (10) per cent.

"No retailer shall sell standard trade-marked drug products whose retail prices are advertised to the public or indicated on the goods, their packages or containers, at a discount greater than twenty-one (21) per cent from such declared retail prices. In case the retail sales of such goods are slow or unsatisfactory, the retailer may give the manufacturer or wholesaler from whom such goods were purchased, if his address be known, the opportunity to repurchase such merchandise at the wholesale delivered price as hereinafter defined, less delivery cost.

" 'Wholesale delivered price' as used herein means the lowest price offered to all members of the retail trade within thirty (30) days prior to date of resale to all retailers of any given division of retail trade, less only such discounts as are extended to all such retailers and plus delivery costs." (There may be changes in the foregoing.)

After all, the success of a code depends on the desire and willingness of those affected to carry on. There must also be coöperation of those in the same group and hence the AMERICAN PHARMACEUTICAL ASSOCIATION seeks to work with the National Association of Retail Druggists and retail druggists generally, and representatives of these Associations have been in Washington during the considerations given to the codes. It is reasonable to assume that before the end of the month definite conclusions will be reached, when facts can be given instead of possibilities or probabilities.

THE EIGHTY-FIRST ANNUAL MEETING OF THE A. PH. A.

THE program of the General Sessions of the Madison meeting was enhanced by the address of Dr. W. G. Campbell, Chief of the Food and Drug Administration. He gave the members an understanding of what is proposed by the revision of the Food and Drugs Act, and a resolution dealing with the subject was presented in the House of Delegates and adopted by the ASSOCIATION.—See Resolution No. 4.

The members were greatly pleased with the report of Chairman H. A. B. Dunning on the Headquarters—a number of photographs by S. L. Hilton and others, showing the progress of the building were exhibited. Further efforts were interestingly explained and the responsibilities and opportunities of the members were stressed.

Chairman H. C. Christensen reported on the Pharmacy Exhibit at Chicago, and enlisted interest in its behalf; he received the applaud of the membership and a resolution of thanks was conveyed to him and others of the committee whose efforts made the exhibit possible.

The exhibit and symposium on professional pharmacy was a great success and impressed the importance of this work on the members. Represented in the exhibit were preparations of the Pharmacopœia, a display of the details of pharmacopœial revision; a similar display was shown of the National Formulary together with surveys for determining the extent of use of official preparations and other *Materia Medica* in prescription practice. The exhibit of the Recipe Book preparations showed the possibilities of bringing these to the attention of physicians. Chairman E. Fullerton Cook, E. N. Gathercoal and J. Leon Lascoff received many favor-

able commendations and the hope was quite generally expressed that such a symposium should be made part of next year's program.

The West won many honors this year—Dr. H. A. Langenhan and Ewin Gillis, of Seattle, won the Ebert Prize for their paper on Hydrastis; Ivor Jones, of Seattle, the Fellowship of the National Conference of Pharmaceutical Research, and Miles Edward Drake, of Corvallis, Oregon, the Fairchild Scholarship.

The several bodies transacted their business with dispatch and the addresses of presiding officers are given in this issue of the JOURNAL and also the transactions of the Council.

All of the Sections received a liberal number of papers, as also the Conferences, and the latter held a joint session with the Section on Education and Legislation for the discussion of enacted and proposed legislation. The success of this session has suggested a meeting on similar lines for next year. The officers and members of the American Council on Pharmaceutical Education held several sessions in outlining their work.

The Plant Science Seminar convened during the week preceding that of the ASSOCIATION; the National Conference on Pharmaceutical Research on the Saturday preceding; the National Association of Boards of Pharmacy and Association of Colleges of Pharmacy on Monday and Tuesday of Convention Week. The roster contains a list of new officers and the reports of the various sessions will be published in the usual order and, therefore, no mention other than the foregoing is made at this time.

It is regretted that several of our former presidents were absent on account of sickness, or taken ill after arriving in Madison, among them were Frederick J. Wulling, C. Herbert Packard, Charles H. LaWall (absent on account of Mrs. LaWall's poor health), H. H. Rusby. C. W. Johnson had to return home because of sickness and L. L. Walton was taken ill soon after his arrival in Madison; both are recovering. The entertainments for the ladies were many, including luncheons, receptions, card parties, excursions on Lake Mendota, visits to the capitol, University, shopping tours, etc. Aside from these functions there were dinners and the annual banquet and the fraternity luncheons and dinners.

Dr. and Mrs. Edward Kremers entertained the members of the Plant Science Seminar at their home "The Highlands;" an additional feature was a Campfire Talk by Dr. C. E. Brown, Curator of the Historical Museum. Dr. and Mrs. Kremers also entertained the members of the ASSOCIATION at their home. Undoubtedly there have been omissions in making these brief references and pardon is asked. Other individuals should be mentioned, but this would lead to other omissions, therefore a general expression of appreciation will have to answer.

Saturday (September 2nd) was the outstanding day of the week, including an excursion to the dells of the Wisconsin River, beautiful and scenic; and an Indian Pageant held in Natural Outdoor Theatre closed the day.

To do justice to the beautiful scenes, and give expression to the story told by the Indians, is not possible by this writer as it would require more space than available in this issue of the JOURNAL.

Coming to a conclusion, the meeting in Madison was a success in every way, the hosts arranged most delightful programs and to all who shared in arranging the entertainments our sincere thanks and appreciation are extended.

SCIENTIFIC SECTION

BOARD OF REVIEW ON PAPERS.—*Chairman*, L. W. Rowe; John C. Krantz, Jr.; F. J. Bacon.

THE PHARMACOLOGICAL ACTION OF TEN AMINES RELATED TO EPHEDRINE AND TRYPTAMINE.*

BY K. K. CHEN AND A. LING CHEN.

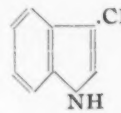
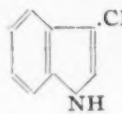
In 1929 one of us (K. K. C.) in association with Wu and Henriksen (1) reported results on a series of 27 amines related to ephedrine and drew certain conclusions regarding the relationship between pharmacological action and chemical constitution. Since then 10 additional amines have been made available to us, and a similar investigation has been carried out with them on animals. As shown in Table I, the first 4 substances are ephedrine derivatives and the next 5 contain an indole ring. The last member, cino-bufotenine, is a constituent of the Chinese toad poison *Ch'an Su*, raises the arterial blood pressure and has been shown by Jensen and Chen (2) to be an amine derived from an indole. The chief object of this paper is to furnish (*a*) a comparison of the physiological activity of the different compounds with particular reference to epinephrine and ephedrine, and (*b*) a further elucidation of the relationship between chemical structure and pharmacological effects.

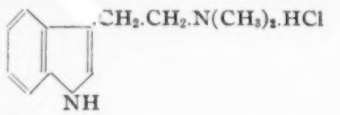
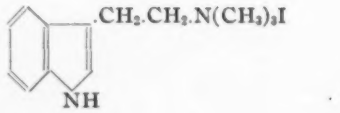
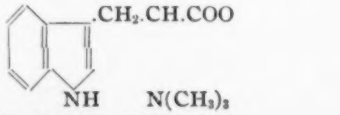
Of the 10 compounds listed in Table I, we are indebted to Dr. R. H. F. Manske, National Research Council, Ottawa, Canada, for Nos. 6, 7, 8 and 9; to Dr. O. Schaumann, I. G. Farbenindustrie A. G., Frankfurt a. Main-Hoechst, Germany, for Nos. 3 and 4; to Dr. R. W. Jackson, Yale University, New Haven, for No. 9; and to Dr. W. H. Hartung, Sharp and Dohme, Baltimore, for Nos. 1 and 2. We also wish to acknowledge our gratitude to Dr. H. Jensen, Johns Hopkins Medical School, for suggestions of study and for his assistance in securing hypaphorine and the four tryptamines from the proper authorities. Cino-bufotenine was prepared by ourselves as a flavianate.

Before the presentation of the data, a brief résumé of the status of these compounds may be desirable. Both *p*-methyl- and *p*-methoxy-*nor*-ephedrines have been shown by Hartung and his associates (3) (4) (5) to have a weaker pressor action than phenylpropanolamine. Compound No. 3, *3,4*-dihydroxy-*nor*-ephedrine, was suggested for further study by Chen, Wu and Henriksen (1), and reports have since been made by Schaumann (6), Raymond-Hamet (7), Hartung and his associates (5) and Tainter (8). Compound No. 4, *3,4*-dihydroxy-ephedrine, is relatively new, and its physiological effects have been studied by Schaumann (6) and Raymond-Hamet (7). Tryptamine, or indole-ethylamine, has been subjected to animal experimentation by Ewins and Laidlaw (9), Guggenheim and Löffler (10), and Guggenheim (11). The methyl derivatives of tryptamine are the results of Manske's recent work (12). Hypaphorine occurs in the seeds of *Erythrina hypaphorus* (13) or *E. variegata var. orientalis* (14), and its synthesis has been perfected by Romburgh and Barger (15). A metabolic investigation with this product has been made by Jackson (16). Hypaphorine is of special interest in the present series because Wieland, Hesse and Mittasch (17) believe that it is closely

* From the Lilly Research Laboratories, Eli Lilly and Company, Indianapolis.

TABLE I.—PHARMACOLOGICAL ACTIVITY OF COMPOUNDS RELATED TO EPHEDRINE AND TRYPTAMINE.

Compound No.	Name.	Formula.	M. P. ° C. Corrected.	Pressor Action in Pithed Cats.	Rabbit's Pupil.	Isolated Rabbit's Intestine.	Isolated Guinea Pig's Uterus.
1	*p*-Methyl-*nor*-ephedrine HCl		205–206	+	Dilated	Slightly stimulated	Stimulated
2	*p*-Methoxy-*nor*-ephedrine HCl		224.5	+	No response (4% solution)	Slightly stimulated	Stimulated
3	*3,4*-Dihydroxy-*nor*-ephedrine HCl		179–180	1/4 of epinephrine	Definitely dilated	Inhibited	Stimulated
4	*3,4*-Dihydroxy-ephedrine HCl		189	1/40 of epinephrine	Definitely dilated	Inhibited	Stimulated
5	Tryptamine HCl		252–253	+++	No response	Slightly stimulated	Stimulated
6	Methyl-tryptamine HCl		180	++	No response	Slightly stimulated	Stimulated

7	Dimethyl-tryptamine HCl		Hygroscopic	+	No response	Slightly stimulated	Stimulated
8	Trimethyl-tryptamine Ammonium Iodide		197	$^1/_{21}$ of epinephrine	No response	Definitely stimulated	Stimulated
9	Hypaphorine		238	No response	No response	No response	No response
10	Cino-bufotenine Flavianate	$C_{13}H_{27}O_2N_2.C_{10}H_6O_5N_2S$	200.5	$^1/_{10}$ of epinephrine	Slightly constricted	Definitely stimulated	Stimulated

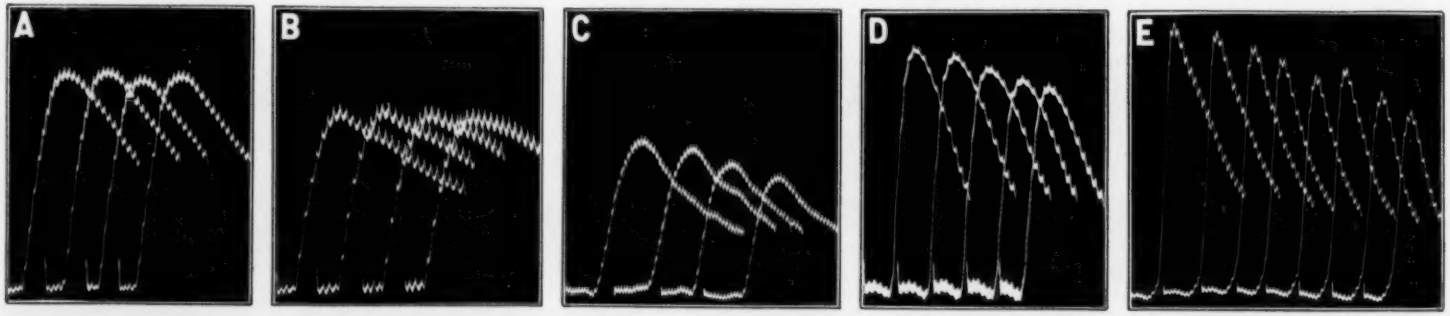


Fig. 1.—Action on blood pressure by repeated injections with five amines.

A. *3,4*-Dihydroxy-*nor*-ephedrine HCl, 1:5000, 0.4 cc. for each injection in a pithed and vagotomized cat, female, weighing 1.78 Kg.
B. *3,4*-Dihydroxy-ephedrine HCl, 1:500, 0.4 cc. for each injection in a pithed and vagotomized cat, female, weighing 2.088 Kg.
C. Tryptamine HCl, 1:500, 0.4 cc. for each injection in a pithed and vagotomized cat, female, weighing 2.552 Kg.
D. Trimethyl-tryptamine ammonium iodide, *M*/320 (ca. 1:1000), 0.4 cc. for each injection in a pithed and vagotomized cat, female, weighing 1.746 Kg.
E. Cino-bufotenine flavianate, 1:4000, 0.8 cc. for each injection in a pithed and vagotomized cat, male, weighing 3.3 Kg.

related to cino-bufotenine ("bufotenidine"). If that were the case, it might also be expected to have a pressor action like cino-bufotenine (18).

The present investigation comprises studies with the above products on the blood pressure in pithed cats, and on smooth muscle organs—rabbits' pupils, isolated guinea pigs' uteri and rabbits' intestines. On several occasions, perfusion experiments were made in frogs to determine the cardiac or vascular changes. The results are summarized in Table I.

A. PRESSOR ACTION.

The rise of blood pressure as observed in pithed cats is probably the best indicator of the inherent property of amines of this group. In two experiments, it was found that both *p*-methyl- and *p*-methoxy-*nor*-ephedrines had only a trace of pressor action. When compared equimolecularly with *nor*-ephedrine and *p*-hydroxy-*nor*-ephedrine, they were shown to be much less active. It is thus clear that the replacement of H on the benzene ring at the *p*-position, or on the OH group at the *p*-position, by a simple alkyl group such as a methyl radical is unfavorable to the pressor action.

3,4-Dihydroxy-*nor*-ephedrine (racemic) is the most powerful of the whole list. In 10 pithed cats, the average pressor action was determined to be $^1/_4$ that of epinephrine. A 1:5000 solution of *3,4*-dihydroxy-*nor*-ephedrine matched very closely with one of 1:20,000 of epinephrine in the majority of animals. Unlike ephedrine, with this synthetic product there is no prolongation of action and no loss of effectiveness on repeated intravenous injections (see Fig. 1).

The same ratio of activity between *3,4*-dihydroxy-*nor*-ephedrine and epinephrine, that is, 1:4, was obtained by perfusion experiments in frogs for cardiac stimulation or vaso-constriction. The minimal concentration of *3,4*-dihydroxy-*nor*-ephedrine that increased both the rate and the amplitude was 1:2,500,000, while that of epinephrine which produced the same effect was 1:10,000,000. Similarly, the minimal effective concentration of the former for vaso-constriction was 1:2,000,000 and that of the latter 1:8,000,000. It has been our impression that the vaso-constricting action in frogs of *3,4*-dihydroxy-*nor*-ephedrine is relatively less prompt than that of epinephrine.

Tainter (8) and Hartung and co-workers (5) working with Hartung's product concluded that *3,4*-dihydroxy-*nor*-ephedrine has $^1/_{12}$ the activity of epinephrine, or indirectly, it is $^1/_3$ as active as the German preparation which we studied. It is possible that Hartung's compound had not attained its highest purity since he stated that he had failed to find a suitable solvent for recrystallization (5).

Compound No. 4, *3,4*-dihydroxy-ephedrine (racemic), is $^1/_{10}$ as active as *3,4*-dihydroxy-*nor*-ephedrine, or $^1/_{40}$ as active as epinephrine, but is decisively more powerful than ephedrine in animals by intravenous injections. In 10 pithed cats, a small volume (say 0.4 cc.) of a 1:500 solution of *3,4*-dihydroxy-ephedrine caused practically the same rise of blood pressure as that produced by an equal volume of a 1:5000 solution of *3,4*-dihydroxy-*nor*-ephedrine, or a 1:20,000 solution of epinephrine. Like the latter, *3,4*-dihydroxy-ephedrine has a brief action, and repeated administration does not diminish the sensitivity of animals to it, as shown in Fig. 1.

Of the four tryptamines, the order of activity on the blood pressure was found to be as follows: dimethyl-tryptamine < methyl-tryptamine < tryptamine < tri-

methyl-tryptamine ammonium iodide. Four cats were used in the determination. The fact that tryptamine is stronger than methyl- and dimethyl-tryptamines, and *3,4*-dihydroxy-*nor*-ephedrine stronger than *3,4*-dihydroxy-ephedrine, is in keeping with our previous observation (1) that primary amines are more powerful than secondary or tertiary amines. The ammonium iodide of trimethyl-tryptamine has a marked pressor action. An *M*/320 solution matched very closely in two pithed cats a 1:20,000 solution of epinephrine—making the ratio of activity approximately 1:21. This increase of potency is to be expected for Barger and Dale (19) discovered some time ago that the quaternary ammonium salts are much more powerful than the corresponding less highly methylated amines. They further observed that these substances have a nicotine-like effect. The quantity of the present compound available was not sufficient to permit a thorough study, but *a priori* one would be tempted to assume that it would have the same type of action, that

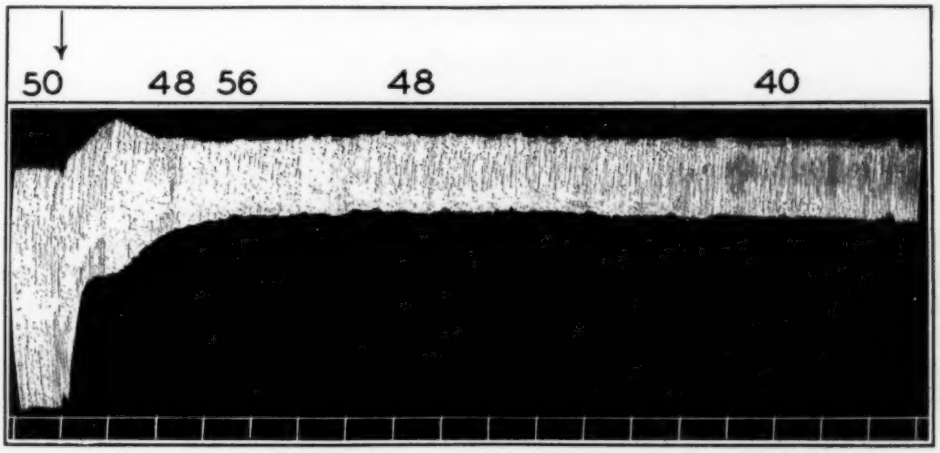


Fig. 2.—Action of trimethyl-tryptamine ammonium iodide on frog's heart.

Frog, male, weighing 69 Gm., and pithed, was perfused (at arrow) through the inferior vena cava with a 1:5000 solution of trimethyl-tryptamine ammonium iodide. The figures refer to ventricular rates per minute.

is, a nicotine-like effect. Both tryptamine and trimethyl-tryptamine ammonium iodide gradually lose a small fraction of their blood pressure raising property upon repeated intravenous injections (Fig. 1).

Hypaphorine in the dosage of 5 mg. did not raise the blood pressure, while cino-bufotenine in the form of a flavianate has $^1/_{10}$ the pressor action of epinephrine (18). This appears to indicate that cino-bufotenine is more likely a derivative of tryptamine than of hypaphorine. Furthermore, trimethyl-tryptamine ammonium iodide, like cino-bufotenine, has a tendency to increase the tone of the frog's heart when perfused through the inferior *vena cava*, as shown in Fig. 2. There is also a gradual diminution of the action on the blood pressure with cino-bufotenine (see Fig. 1).

B. ACTION ON SMOOTH MUSCLE ORGANS.

From Table I, it may be noted that, with the exception of *p*-methoxy-*nor*-ephedrine, other ephedrine derivatives all have a mydriatic action. The results in

general agree with our former observation that an OH group on the C-atom next to the benzene ring is essential for the dilatation of the pupil. The tryptamines and hypaphorine have practically no action on the pupil. Cino-bufotenine, however, constricts it (18).

On the isolated rabbit's intestine the majority of substances under investigation exert a stimulating action, most marked with trimethyl-tryptamine ammonium iodide and cino-bufotenine flavianate (Table I). Like epinephrine, both *3,4*-dihydroxy- and *3,4*-dihydroxy-*nor*-ephedrines inhibit intestinal movements. Hypaphorine is the only one of these amines that is devoid of any action.

All the compounds, except hypaphorine, contract the isolated virgin guinea pig's uterus. Epinephrine was tested on those strips of uteri with which *3,4*-dihydroxy- and *3,4*-dihydroxy-*nor*-ephedrines were studied, and was found to be oxytocic also. In other words, the similarity between the two dihydroxy-ephedrines and epinephrine is qualitatively very great.

SUMMARY.

A series of 10 amines, 4 of which are ephedrine derivatives and the remaining 6 contain an indole ring, have been studied pharmacologically.

If the blood pressure is taken as the criterion, an introduction of a methyl or methoxy radical at the *p*-position in the *nor*-ephedrine molecule results in a reduction of activity. The replacement of two OH groups for H at the *3,4*-positions on the benzene ring greatly increases the intensity but abolishes the prolongation of the action. *3,4*-Dihydroxy-*nor*-ephedrine has $^1/_4$ and *3,4*-dihydroxy-ephedrine $^1/_{40}$ the activity of epinephrine (natural). Repeated intravenous injections of both compounds elicit the same responses as those produced by the first injection. They dilate the pupil and inhibit intestinal movements.

Tryptamine is more powerful than methyl- or dimethyl-tryptamines, but decisively less active than trimethyl-tryptamine ammonium iodide. The last one has $^1/_{21}$ the activity of epinephrine, as far as the blood pressure is concerned.

p-Methyl- and *p*-methoxy-*nor*-ephedrines and all the tryptamines investigated stimulate isolated rabbits' intestines and guinea pigs' uteri. They have practically no action on rabbits' pupils, except *p*-methyl-*nor*-ephedrine which dilates them slightly.

Hypaphorine does not produce effects similar to those of the tryptamines.

Physiologically, cino-bufotenine, which has $^1/_{10}$ the pressor action of epinephrine, is more like a derivative of tryptamine than of hypaphorine.

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PHYTOCHEMICAL NOTES.*,[1]

No. 109. On the Non-Preëxistence of Azulene in Milfoil.

BY KATHERINE GRAHAM.[2]

The preëxistence of azulene in plants was first questioned by Tschirch and Hohenadel in 1895 (1), when they observed that sagapen yielded a yellow oil upon extraction with petroleum ether and that this oil became blue during fractionation. Not knowing whether the formation of the blue substance was due to the exposure of the volatile oil extracted with petroleum ether or to resin extracted at the same time, they prepared a resin-free volatile oil by steam distillation. This also was faintly yellow and only upon fractional distillation involving higher temperatures, *viz.*, abt. 200°, did they obtain a blue fraction. They, therefore, arrive at the conclusion that "without doubt, the blue oil is a pyrogenic decomposition product" (2). In 1917, however, Tschirch expresses himself as still in doubt as to whether the azulene is formed during the process of distillation (3).

Herzenberg and Ruhemann made a similar investigation in 1927 (4). They found that chamomile yielded only a small amount of a yellow oil to petroleum ether but that the extracted plant yielded a blue oil upon steam distillation. From this they concluded that azulene did not preëxist in the plant and that its formation was from sesquiterpenes by fermentative action especially since they had isolated a sesquiterpene which yielded a blue color by dehydrogenation. However, the experiment performed does not support this conclusion. If the azulene were formed from sesquiterpenes, it would not then be obtained from the extracted marc, from which the sesquiterpenes had been removed. Furthermore, fermentative action would not be expected during steam distillation, where the temperature is much above the thermal death point of enzymes. Nor is dehydrogenation likely to take place during steam distillation.

The existence of azulene in the plant may more logically be explained by the assumption of an acid addition product since it is known that azulene readily forms such a product which is not soluble in petroleum ether. The union of azulene with either phosphoric acid or an acid phosphate would presumably give

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* From the laboratory of Edward Kremers.
[1] Scientific Section, A. Ph. A., Miami meeting, 1931.
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a compound which could not be extracted with petroleum ether but which could be decomposed by the action of steam.

Another hypothesis which may explain the presence of combined azulene, *i. e.*, in a form which cannot be extracted with petroleum ether, is that it may exist in glucosidal combination. We usually consider glucosides to be ether-like products of the union of a sugar and an alcohol. It is barely possible that a hypothetical colorless alcohol, $C_{15}H_{19}OH$, when set free and at the higher temperatures involved in fractionation, loses a molecule of water thus yielding the blue hydrocarbon. This hypothesis is based on a possible analogy with the formation of a terpene, $C_{10}H_{16}$, observed by Kayser (5) in 1884 when he obtained it upon the hydrolysis of the glucoside, picrocrocin. The presumption in this case is that a terpene alcohol results upon hydrolysis of the glucoside and that under the conditions of the experiment the alcohol breaks up into the terpene and water.

The experiment of Herzenberg and Ruhemann made with chamomile has been repeated upon a larger scale with milfoil. The results found are in accordance with those of the earlier investigators.

The material used was collected in June 1930, from the garden of the Wisconsin Pharmaceutical Experiment Station and from land southwest of Madison, under the direction of Professor W. O. Richtmann. Having been air dried, the inflorescences were carefully removed and ground in a Grumbach mill.

I. Extraction of the Flowers with Petroleum Ether and Subsequent Distillation.—4988 Gm. of the ground milfoil flowers were extracted with petroleum ether in a Lloyd extractor. The flowers thus extracted were exposed so as to allow any adhering petroleum ether to evaporate. They were then transferred to a 60-liter Lentz copper still and subjected to steam distillation. The periods of distillation and the amount of aqueous distillate obtained in each are herewith tabulated:

Period—Day.	Time—Hours.	Amount—Gallons.	Period—Day.	Time—Hours.	Amount—Gallons.
1st	2	7	6th	0	0
2nd	3	10	7th	5	15
3rd	2	12	8th	1½	5
4th	0	0	9th	4½	20
5th	0	0	10th	1	5
			Totals	19	74

The distillation was discontinued when no more color could be extracted from the distillate with ether. The aqueous distillate, which gave no acid reaction with litmus paper, was shaken with ether, and the ethereal solution separated. The solvent was recovered by distillation and there remained 4.8 cc. (0.096 per cent) of a deep blue oil, which had a density of 0.9516 at 25°. This oil was treated with phosphoric acid, and the azulene-phosphoric acid compound hydrolyzed with water. The liberated azulene was extracted with ether and after the removal of the solvent 0.5 cc. of azulene remained (0.01 per cent).

The petroleum-ether extract resulting from the percolation of the flowers was distilled under reduced pressure to remove the solvent. The residue thus obtained weighed 186 Gm. When steam distilled, 12 cc. (0.24 per cent) of a light blue oil separated from the aqueous distillate. It had a density of 0.9105 at 25°. The oil was fractionated under atmospheric pressure with the following results:

Temperature.	Amount.
−170°	0.3 cc.
170–180°	2.0 cc.
180–190°	2.5 cc.
190–200°	2.1 cc.
200°+	4.2 cc.

II. Extraction of the Azulene Compound with Chloroform. 1. Hot.—100 Gm. of the ground flowers were placed in a continuous extractor and exhausted with chloroform. The heat of the vapors was sufficient to keep the small percolator warm during the extraction. The solvent was removed from the extract by distillation under reduced pressure and the extract washed with solvents, resulting in the following products:

(A) A petroleum-ether extract,

(B) An ether extract and

(C) A residue.

(A) The petroleum-ether extract was steam distilled and the distillate washed with ether. The ethereal solution was colored blue.

(B) The ether extract was steam distilled and the distillate washed with ether. The ethereal solution was also colored blue.

(C) The residue was steam distilled and the distillate washed with ether, yielding no blue color.

(D) The extracted flowers were distilled with steam and the aqueous distillate yielded no blue color when washed with ether.

2. Cold.—1000 Gm. of the dried flowers were extracted by maceration with chloroform at room temperature. From the chloroformic extract the solvent was removed by distillation under reduced pressure. This extract was treated as in the previous experiment and resulted in similar products:

(A) The petroleum ether was removed by distillation under reduced pressure. The extract was steam distilled and yielded 3.4 cc. (0.34 per cent) of a yellow oil.

(B) The ether extract was steam distilled after the removal of the ether. The distillate, when washed with ether, yielded a blue color.

(C) The residue was steam distilled and the distillate yielded a blue color.

(D) The extracted flowers, when steam distilled, yielded a faint blue color.

3. Extraction by Percolation.—Two samples of 1000 Gm. each of the ground flowers were packed in a percolator and extracted with chloroform. The chloroform was removed from the extract by distillation under reduced pressure. The extracts were treated as in the previous experiment:

(A) The petroleum ether was removed by distillation under reduced pressure. The extracts were steam distilled and 3 cc. and 3.1 cc., respectively, of a yellow oil resulted.

(B) The ether was removed by distillation under reduced pressure and the extracts steam distilled. The distillate from both extracts yielded a blue color.

(C) The residues were steam distilled and both yielded a blue color.

(D) The extracted flowers were distilled with steam and no blue color was obtained.

4. Preparation of the Chloroform Extract on a Larger Scale.—15,400 Gm. of the ground flowers were packed in percolators and extracted with chloroform. The chloroform was removed by distillation under reduced pressure and 1520 Gm. of extract resulted. The extract was washed with petroleum ether, resulting in two products:

(A) 377 Gm. of a petroleum-ether extract, and

(B) 790 Gm. of residue.

III. The Azulene Compound.—The 790 Gm. of chloroform extract deprived of its petroleum ether-soluble constituents and containing the azulene compound were used in the following experiments.

(*1*) *Determination of the Inorganic Constituents.*

(*a*) 0.8277 Gm. of the extract yielded no ash.

(*b*) 1.6176 Gm. of the extract yielded 0.0001 Gm. ash.

These results indicate the improbability of an acid salt addition product since azulene is not known to add to any organic acid except formic, with which it forms a liquid and easily hydrolyzed compound.

(*2*) *Acid Hydrolysis.*—If azulene is contained in the molecule in glucosidal combination, hydrolysis with acid should liberate it from the accompanying sugar molecule, which could be detected. The extract reduced Fehling's solution before hydrolysis. After hydrolyzing with dilute hydrochloric acid the amount of copper oxide was increased but constant values could not be obtained.

The extract was hydrolyzed for ten hours with 5 per cent sulphuric acid. After the reaction mixture was filtered it was divided and made neutral with sodium hydroxide. One-half of the neutralized solution was extracted with ethyl acetate. Both portions were then treated with Fehling's solution. The untreated portion did reduce Fehling's solution. The portion washed with ethyl acetate did not reduce the copper solution.

(*3*) *Ester Value.*—The ester value of the extract was determined in order to obtain an indication of the possibility of alkaline hydrolysis.

(*a*) 0.4204 Gm. of the extract required 0.379 cc. of normal potassium hydroxide for neutralization, corresponding to an acid value of 36. When heated for one-half hour, the sample reacted with 1.94 cc. of normal potassium hydroxide, corresponding to a saponification value of 184. Ester value = 148.

(*b*) 0.4046 Gm. of the extract required 0.4 cc. of normal potassium hydroxide for neutralization, corresponding to an acid value of 39. When heated, it reacted with 1.94 cc. of normal potassium hydroxide, corresponding to a saponification value of 191. Ester value = 152.

(*4*) *Alkaline Hydrolysis.*—The extract was treated for an hour with sodium hydroxide solution without heat. The mixture was filtered on a force filter and the residue (*a*) washed with water. The filtrate was made acid with dilute hydrochloric acid, added slowly and with continuous stirring. The resulting precipitate was separated on a force filter and washed with water (*b*). The filtrate was distilled to dryness and the residue extracted with alcohol, which was removed by distillation (*c*). The results of the hydrolysis are shown in the accompanying table:

Reagent NaOH.	Extract.	Insoluble Substance (*a*).	Soluble substance (*b*).	Residue (*c*).
5 p. c.	4 Gm.	0.05 Gm.	0.7 Gm.	.....
5 p. c.	10 Gm.	0.3 Gm.	4.5 Gm.	3.0 Gm.
5 p. c.	10 Gm.	0.1 Gm.	2.0 Gm.	7.2 Gm.
5 p. c.	10 Gm.	0.1 Gm.	4.3 Gm.	3.5 Gm.
2 p. c.	10 Gm.	2.7 Gm.	1.2 Gm.	5.0 Gm.
2 p. c.	10 Gm.	2.7 Gm.	1.9 Gm.	4.5 Gm.
2 p. c.	10 Gm.	3.7 Gm.	1.0 Gm.	4.5 Gm.

The acid precipitated substances of the first four experiments were bulked and neutralized with sodium hydroxide. This sodium salt was used to prepare the barium and silver salts. 5 Gm. of the sodium salt yielded 2 Gm. of the barium salt, which was analyzed for barium content.

(*a*) 0.9198 Gm. of the barium salt yielded 0.0968 Gm. of barium carbonate corresponding to 7.32 per cent of barium.

(*b*) 1.0230 Gm. of the barium salt gave 0.1070 Gm. of barium carbonate, corresponding to 7.38 per cent of barium.

5 Gm. of the sodium salt were treated with silver nitrate and yielded 5.5 Gm. of silver salt, which upon analysis yielded the following results:

(*a*) 0.9760 Gm. of the silver salt gave 0.2395 Gm. of silver, corresponding to 24.5 per cent of silver.

(*b*) 1.0945 Gm. of silver salt gave 0.2690 Gm of silver, corresponding to 24.57 per cent of silver.

Attempts to form oximes or acetyl derivatives with other products of the hydrolysis yielded no results.

(*5*) *Carbonyl Oxygen.*—(*a*) Reaction with phenyl hydrazine. 0.5 Gm. of the extract was dissolved in alcohol. 2 cc. of acetic acid and 5 cc. of phenyl hydrazine were added. The mixture was warmed for 10 minutes. Upon cooling, small crystals of phenylhydrazine acetate, m. p. 127°, settled out and were filtered off. The mother liquor yielded an amorphous product with no characteristic melting point.

(*b*) Reaction with hydroxylamine. 2 Gm. of the extract were dissolved in alcohol and treated with 2 Gm. of hydroxylamine hydrochloride and sodium carbonate. Upon standing, a grayish green amorphous precipitate formed. This precipitate was filtered off and treated with hydrochloric acid. The resulting solution gave no reduction of Fehling's solution.

(*6*) *Hydroxyl Groups.*—(*a*) Acetylation. 5 Gm. of the extract were heated with acetic acid anhydride and sodium acetate for one hour. The product was washed with sodium car-

bonate solution, then with water and dried. The saponification value of this product could not be determined because of the color.

(*b*) Benzoylation. 13.5 Gm. of the extract were dissolved in 50 cc. of pyridine and cooled well. 15 cc. of benzoyl chloride were added in small portions, shaking after each addition. White crystals separated which were filtered off on a force filter and washed with pyridine. The platinum double salt of these crystals melted at 240° (indicating pyridine hydrochloride). The filtrate was diluted with ether. 2.2 Gm. of an insoluble residue remained, which when treated with sodium hydroxide gave an odor of pyridine. The ethereal solution was washed with dilute hydrochloric acid, with sodium carbonate solution and with water and the ether removed by distillation under reduced pressure. 14 Gm. of the ester were obtained.

(*a*) 1.0860 Gm. of the ester reacted with 4.88 cc. of normal sodium hydroxide, corresponding to a saponification value of 178.

(*b*) 0.9885 Gm. of the ester reacted with 4.39 cc. of normal sodium hydroxide, corresponding to a saponification value of 179.

7. *Oxidation with Nitric Acid.*—Since the action of nitric acid upon azulene is not known it would render the situation less complicated if the azulene could be removed from the molecule before oxidation. Steam distillation of the extract yielded the azulene very slowly, some blue color being obtained after 70 hours of distillation. Therefore, other means for the removal of the azulene were sought.

5 Gm. of the extract were mixed with 300 cc. of water and placed in a heavy-walled, tightly stoppered bottle and heated on an oil-bath at 150° for eight hours. The contents of the bottle were then steam distilled. The first distillate yielded a deep blue color and as distillation continued less and less of the color was obtained. However, after 60 hours of distillation some blue color was still obtained.

Acid hydrolysis, using 15 per cent hydrochloric acid in amyl alcohol solution (6), yielded no azulene when the contents of the flask were steam distilled. The same reaction was tried under pressure with no different results. Therefore, the attempts to remove azulene from the molecule were abandoned.

Oxidation of the extract was conducted in the following manner: 5 Gm. of the extract were mixed with 20 cc. of nitric acid, added slowly while the mixture was kept well cooled. The mixture was then allowed to warm slightly, almost to room temperature. As soon as brown fumes were evolved the mixture was cooled in an ice-bath so that the reaction proceeded slowly. When no more brown fumes were evolved from the mixture at room temperature, the reaction was regarded as complete. An insoluble substance rose to the surface of the liquid and was separated and washed with water. The reaction mixture was diluted with water and a flocculent precipitate resulted which was filtered off and washed with water. The bright yellow aqueous liquids were united and saved for further investigation.

The results of four such experiments are given in the following table.

Extract.	Insoluble Substance.	Soluble Substance.	Total.
5 Gm.	.....	1.19 Gm.	.....
5 Gm.	3.89 Gm.	0.45 Gm.	4.34 Gm.
5 Gm.	1.6 Gm.	1.6 Gm.	3.2 Gm.
5 Gm.	1.6 Gm.	1.22 Gm.	2.82 Gm.

The products were combined and washed with boiling alcohol. This procedure yielded 1.4 Gm. of a substance insoluble in alcohol, 1.2 Gm. of a substance which precipitated from the hot alcohol and 6 Gm. of an amorphous residue left upon evaporation of the mother liquid. This residue was acid to litmus, soluble in sodium hydroxide solution from which it was precipitated by acid. From the sodium salt a barium and a silver salt were prepared.

(1) 0.3330 Gm. of the barium salt yielded 0.0190 Gm. of barium carbonate corresponding to 4.1 per cent of barium.

(2) 0.7100 Gm. of the barium salt yielded 0.5000 Gm. of barium carbonate, corresponding to 4.7 per cent of barium.

(3) 0.8080 Gm. of the silver salt yielded 0.1762 Gm. of silver, corresponding to 21.8 per cent of silver.

(4) 0.7000 Gm. of the silver salt yielded 0.1470 Gm. of silver, corresponding to 20.0 per cent of silver.

The aqueous liquids from the oxidation mixture were distilled and resulted in a clear, acid distillate and a yellow, acid residue from which nothing solid separated. The distillates were combined and neutralized with barium carbonate. The mixture was filtered and the residues tested for organic matter. None was found present. The aqueous portion was concentrated and the crystals obtained did not char. This excludes the possibility of volatile acids resulting from the oxidation.

The residues were combined and neutralized with barium carbonate. The excess barium carbonate was filtered off and gave no test for organic matter. The aqueous portion when evaporated to dryness was found to contain organic material. A positive test for picric acid could not be obtained.

SUMMARY.

It has been shown that azulene does not preëxist in the flowers of milfoil but is formed during the process of distillation in the preparation of the volatile oil.

The azulene-yielding compound is contained in the chloroformic extract from which the petroleum ether-soluble constituents (bulk of the so-called volatile oil but minus the blue azulene) have been removed.

The nature of this compound has not yet been determined.

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WASHINGTON BELLADONNA AND METHODS OF ASSAY.*

BY CLAIRE EVANS AND F. J. GOODRICH.

The somewhat unstable character of the active principles found in belladonna plants is well known and, in fact, the chemistry and structure of the important components have been thoroughly studied. The assay of the roots, as well as the leaves, of many belladonna plants for mydriatic alkaloids has been made, resulting in great variations with different samples. Some quantitative methods have been tried experimentally on prepared samples of the drug and many explanations offered as to the varying amounts of the alkaloids. Undoubtedly, numerous factors are responsible for the large differences in alkaloidal content of both roots and leaves.

It has been deemed of interest to investigate the alkaloidal content of belladonna roots collected over a period of years, using different, selected methods for making the determinations. Roots grown on the University of Washington campus were chosen because no assays, so far as could be learned, had been made on belladonna of western Washington. The purpose of the present study has been, therefore, to select a satisfactory method of assay and to determine the quantity of alkaloids from roots grown in the Pacific Northwest, collected in successive years and aged for varying periods.

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* Scientific Section, A. PH. A., Toronto meeting, 1932.

Many methods of analysis and modifications of these methods were tried. Those reviewed were the ones outlined by the United States Pharmacopœia since 1900, as well as the methods used by Mayer (1), Lyons (2), Gunther (3), Lefort (4), Thresh (5), Gerrard (6), Dunstan and Ransom (7), Kippenberger (8), Falieres (9), Beckurts (10), Thoms (11) and Rasmussen (12). Several of the methods were not deemed practical for the work, or did not give consistent results, and were not used in the examination of a selected number of samples of belladonna roots.

COMPARISON OF ASSAY METHODS.

In looking for a suitable method with which to assay the roots for alkaloids, many methods were reviewed and four of them were finally adopted: (*a*) the method of the U. S. P. X, (*b*) a modification of the latter, (*c*) a method by Lyons and (*d*) a method by Dunstan and Ransom.

After using the method of assay of the U. S. P. X on several samples and finding the results to agree only fairly well, a slight modification was tried. In place of a percolator, a separatory funnel was used to exhaust the drug. Since it seemed that the tenth-normal acid would cause too great an error in case the exact end-point was not obtained, the alkaloids were finally titrated with twentieth-normal sulphuric acid. The excess was then treated with fiftieth-normal sodium hydroxide, using methyl red as indicator, since the end-point given with it was more readily recognized than that given with cochineal.

Lyons suggested macerating about 10 Gm. of the drug with a mixture consisting of 1 cc. of stronger ammonia water, 4 cc. of alcohol and 5 cc. of chloroform-ether (1:6 by volume). The drug and solvent were thoroughly mixed, packed in a percolator and allowed to macerate for five or ten minutes before percolating with the appropriate solvent. From here the assay was carried on by shaking out with acid, then with chloroform and finally by titrating the alkaloids with twentieth-normal sulphuric acid.

According to the Dunstan and Ransom method about 20 Gm. of the dry, powdered root were exhausted by hot percolation with absolute alcohol. It was found that 60 to 80 cc. of the solvent were required. The percolate was diluted with water, acidified with HCl and repeatedly extracted with chloroform in order to remove fats and pigmented materials. The aqueous liquid was rendered alkaline with ammonia and the alkaloids removed with chloroform, which in turn was evaporated slowly on a water-bath. According to the original method, the alkaloids were determined gravimetrically at this stage.

In using the Dunstan and Ransom method, as specified above, it was found that the alkaloidal residue was never white. It would, therefore, be safe to conclude that there were still some impurities present which would give inaccurate results if the total weight of the residue from the final chloroformic extraction were calculated as alkaloids.

When the alkaloidal residue from the above was titrated with twentieth-normal sulphuric acid, and the excess of the latter titrated with fiftieth-normal sodium hydroxide solution, using methyl red as indicator, much lower results were obtained than by the gravimetric method. A comparison of the percentages obtained by using both the gravimetric and the volumetric methods, to determine the amount of alkaloids after extracting them by Dunstan and Ransom's method,

showed that samples which gave by the volumetric method 0.07, 0.14, 0.07 and 0.065 per cent of alkaloids, gave gravimetrically 0.27, 0.36, 0.27 and 0.14 per cent, respectively. The fact that the results from the gravimetric work were higher would tend to prove the presence of impurities in the residues. In this experimental work, it was therefore decided to titrate the alkaloidal residue.

TABLE I.—COMPARISON OF RESULTS—AIR-DRIED BELLADONNA ROOTS.

	Per Cent of Alkaloids.			
Sample.	U. S. P. X.	Modified U. S. P. X.	Lyons.	Dunstan-Ransom.
1	0.26	0.12	0.38	0.18
	0.30	0.15	0.26	0.32
	0.38	0.32	0.25	0.33
2	0.21	0.136	0.156	0.137
	0.23	0.16	0.190	0.137
3	0.16	0.138	0.096	0.14
	0.19	0.268	0.116	0.17
	..	0.133	0.028	..
4	0.28	0.099	0.053	0.30
	0.29	0.023	0.155	0.30
	..	0.128	0.104	..
	..	0.190	0.060	..
	..	0.092	0.158	..
5	0.18	0.134	0.189	0.13
	0.11	0.167	0.145	0.14
6	0.08	0.128	0.033	0.07
	0.10	0.110	0.109	0.07
	..	...	...	0.067
	..	...	...	0.139

From the accompanying table, reading from top to bottom in the column of results obtained by the U. S. P. X process, it is evident that the results yielded by that method are but fairly constant for each sample assayed. The official procedure also has the disadvantage of requiring much time and repeated testing before exhaustion of the drug is attained.

The figures obtained for the various samples by the modification of the U. S. P. X method show but little in favor of altering the official process in this way.

In the method suggested by Lyons, the solvent (chloroform and ether 1 to 6) proved of no special advantage. The various results obtained by this process, as shown by Table I, differed greatly for the same samples.

The data obtained by using the method suggested by Dunstan and Ransom, followed by titration, gave results which were the most consistent throughout the series of assays. Another point in favor of this method is that the actual attention required to exhaust the drug was less than with other methods, and the technique necessary in transferring the weighed sample of the drug to the Soxhlet was unimportant, whereas with the other assays there was always loss of time and much inconvenience at this stage of the work.

Reading across the table from left to right shows that the percentages obtained for the same sample, by various methods of assay are very discordant,

and the conclusion arises that there is still much room for improvement in the assays used.

Possible reasons for the lack of agreement between the above four methods, as indicated by the results in the first table, might be the absence of total exhaustion, caused by channeling, and insufficient maceration in the case of the total exhaustion processes. The possibility of hydrolysis might explain the lack of checks and the greater or lesser amount of hydrolysis accounts for variation by different methods. Since the final chloroformic solvent was evaporated on a water-bath, some of the volatile alkaloidal principles, claimed by some to be present, might have been dissipated. However, this last explanation could hardly be true, since the evaporation was the same by all methods and they did not all yield unusually low results.

Washington Roots after Storing.—Analyses were made of samples of belladonna roots which were harvested in the following years: 1922, 1923, 1924, 1925, 1926, 1927, from the University of Washington drug garden. No record was made as to exact dates of collections or age of the perennial roots. The collections were presumably made from plants grown prior to 1922, thus making an increase of one year in the growing age of each consecutive sample. These roots were all dried and stored until 1928, when they were assayed. The results were based on Dunstan and Ransom's method with addition of titration. The air-dried drug was used for analysis and the per cent of alkaloid then calculated on the basis of drug dried at 100 degrees C.

TABLE II.—ROOTS AFTER STORING—DRIED AT 100 DEGREES C.

Year of Collection.	Average Per Cent of Alkaloids.
1922	0.348
1923	0.166
1924	0.154
1925	0.318
1926	0.166
1927	0.104

As shown by Table II there was evidently no correlation between the length of time stored and the percentage of alkaloids, since the roots gathered in 1922 contained the largest quantity, while the 1927 roots contained the least. The variability between samples of different years might be accounted for by a possible difference in the total age of the root: *i. e.*, period of growth and time stored taken together. Another significant factor is that they were not collected at exactly the same time of the year.

SUMMARY.

Of the four methods used in this work, the assay by Dunstan and Ransom (with titration) seemed preferable.

In making a comparative analysis of the roots collected in successive years and stored over a period of time, it was found that there was no correlation between length of time stored and alkaloidal content.

The great variability between the samples of different years may be due

to the natural variation of different crops, to the total age of the roots, or to a possible difference in the time of year when they were collected.

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A PHYTOCHEMICAL INVESTIGATION OF THE OLEORESIN OF PINUS MONTICOLA DOUGL.*

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Western White Pine (*Pinus monticola* Dougl.) is a five-needle pine growing on the "middle and upper slopes of northwestern mountains from the west side of the continental divide in northern Montana and British Columbia to Washington, Oregon and California" (1). It is a large source of timber in the West. The oleoresin herewith reported on came from trees growing in an environment far from their optimum; so much so that they offer more than ordinary phytochemical interest. Especially will this be true when the oleoresin from other localities has been analyzed. Unlike most spirits of turpentine, which usually consist of terpenes, sesquiterpenes and their oxygenated products, this oil contains about one per cent of a paraffin hydrocarbon, *n*-undecane, $C_{11}H_{24}$. This gives our investigation added interest since this paraffin has been identified only once before in the plant kingdom. This was found by Simonsen and Rau (2) in 1922 in the oleoresin of *Pincus excelsa* growing in India. In 1913 Schorger (3) isolated a paraffin hydrocarbon from *Pinus lambertiana*. This had physical properties close to

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n-undecane but he lacked a sufficient quantity to identify it. Inasmuch as both *Pinus excelsa* and *Pinus lambertiana* are also five-needle pines and thus closely related to *Pinus monticola* it is more than probable that Schorger's paraffin hydrocarbon was *n*-undecane.

So far as we are aware there have been but two other normal paraffin hydrocarbons identified in the volatile oils, *viz.*, *n*-heptane and *n*-pentadecane. The former occurs in the Jeffrey (*Pinus Jeffreyi*) and Digger (*Pinus sabiniana*) pines of the West and in Petroleum Nuts of the Philippines.

The pentadecane occurs in oil of *Kæmpferia galanga*, a plant of the Zingiberaceæ used as a condiment in India and the Malay Peninsula.

Why has the tree produced this undecane instead of a terpene or a sesquiterpene? We raise the question as food for thought without being able to answer it. Simonsen and Rau point out that *P. lambertiana* and *P. excelsa* are the only members of the "strobus" (five-leafed) group from which the oil of the oleoresin has been analyzed and that each contains a paraffin hydrocarbon. They speculate that perhaps all members of this group produce paraffins in their oleoresins. Our investigation strengthens this view for Western White Pine belongs in this group. Accepting the theory of the organic origin of petroleum, they also ask the question if the pines have been the source of petroleum, at least in certain areas. These hydrocarbons occur in American petroleum and the Coniferæ have been found in the lower strata.

Have environmental conditions caused the tree to produce an unusual constituent? In the past many investigators have cared little about the environment the plant grew in. They were content to report the botanical classification and their analysis. Hence it is possible for two separate workers to contradict each other and yet each be right. Let us illustrate. It is a well-known fact among large turpentine operators of the Southeast that the same species of Pinus will produce different chemical constituents in its oleoresin if produced in different regions. In the West we may cite Western Yellow Pine (*Pinus ponderosa*). Typical Pacific Coast Western Yellow Pine yields a lævo-rotatory oil and consists largely of beta-pinene while the Rocky Mountain form (variety *scopulorum*) has a dextro-rotatory oil and its chief constituent is alpha-pinene. Even on the Pacific Coast the junior author has found that the chemical composition of Western Yellow Pine oleoresin is far from uniform. In view of these facts we consider it essential to report not only the conditions under which these trees are growing but also the time and method of collection of the gum.

THE ENVIRONMENT.

The experimental trees are located in the northern part of the Warner Mountains, which is one of the Great Basin Ranges. Warner Mountain ridge is located chiefly in Modoc County, California. R. J. Russell (4) says of this range, "At the North the mountainous unity is very gradually lost in mergence with a high plateau between Albert Lake and Warner Valley. A similar transition at the southern end of the range unites it with the high plateaus just east of Madeline Plains. Goose Lake Valley is located just west of the range with an extensive body of water in its central part. The easterly slope of the range faces the Surprise Valley. The east of this valley raises Hays Canyon Range from the summit of which a broad plateau extends eastward to the Black Rock Desert. The width of the range in its typical portion varies from about eight to twenty miles. Toward the plateaus the range widens rapidly." The trees that were tapped lie strictly in the Great Basin (5).

Russell defines the Great Basin as an area drained by streams which fail to reach the ocean.

The Warner Mountain forests are separated from the other forests of California and Oregon by extensive sage brush plateaus. The wide alkaline Goose Lake Valley separates the Warner Range from other forests of the northern part of California, while a desert extends east of the range. Western White Pine in the Warner Mountains is thus growing isolated by treeless areas from other localities where this species grows.

In order to show the location in Warner Mountains of the Western White Pine stands where experimental tapping was done, and to show the relation of these stands to other vegetation of this region, it appears to be desirable to trace the changes in vegetation from Buck Creek Ranger Station, located on the Westerly slope of the ridge toward Fort Bidwell in the Surprise Valley. In the vicinity of Buck Creek Station the slope is covered by a Western Yellow Pine forest, with occasional junipers (*Juniperus occidentalis* Hooker). In the open places occur wild plum (*Prunus subcordata* Benth.) in mixture with Mountain Mahogany (*Cercocarpus ledifolius* Nutt.). The elevation of this place is 5400′. On the higher slopes of Buck Creek Canyon Incense Cedar (*Libocedrus decurrens* Torrey) is added to Western Yellow Pine, while at 6000′ White Fir (*Abies concolor* Parry) appears. Flat places occasionally found at this elevation are swampy and occupied by aspen (*Populus tremuloides* Mich.) groves and a ground cover in which *Veratrum* is conspicuous. At 6200′ pure White Fir occupies the ground, although Old Western Yellow Pines go as high as 6750′ in open places, otherwise covered with Choke Cherry (*Prunus demissa* Wal.) and Service Berry (*Amelanchier alnifolia* Nutt.). At 7200′ among the White Firs, some Western White Pines appear. The top of the ridge lies at 7400′. An extensive flat here reaches eastward and is covered with a park-like forest composed of Western White Pine, Lodgepole Pine (*Pinus contorta* Loud.) and occasional White Firs. Dense stands of pure Lodgepole Pine occupy a swampy depression of the flat and extend up the north slope of Fandango Peak, which rises south of the experimental area. Rocky summits are covered with scrubby Mountain Mahogany. The drier and more elevated portions of the flat are covered with sage brush (*Artemisia tridentata* Nutt.) which occupies also the southern slope, where scrubby Aspens occur in places.

The experimental trees were located in this park-like forest at an elevation of 7400′. This area is exposed to severe winds and the trees growing on the edge of the flat show irregular wind-bitten crowns. When the first trip was made to the top of the ridge on June 8, 1929, the whole plateau was covered with deep snow. On June 16th–18th a severe snow storm took place and interfered with the tapping operation. In shady places snow banks 6′ deep were found as late as July 4th. The growing season is very short in this locality and the month of June is a spring month here. Few species of annual plants were flowering during this month but willows (*Salix sp.*) by the stream were blooming. In July *Wyethia mollis* begins to flower and this is the only herbaceous species occupying the ground till the end of the season.

OLEORESIN EXTRACTION.

At the beginning of June, 30 cups were set on the trees; 26 on 13 mature trees and one each on four young specimens. Oblong galvanized cups, and aprons attached with nails instead of the conventional ax insertion, were used in this experiment and scarification was performed with a No. O round hack. Oleoresin as it accumulated in the cups was put into friction top tin cans. The trees were tapped first on June 8th. The first sample of oleoresin was collected June 22nd. The last chipping was done July 27th and the last batch of gum was collected August 4th.

Date.	Oleo Yield, Gm.	Cumulative, Gm.	Yield per Cup per Streak, Oz.	Notes.
June 22	403	403	0.90	30 cups
June 30	1528	1931	1.80	....
July 7	1048	2979	1.20	....
July 10	1092	4071	1.35	27 cups
July 13	812	4883	0.97	30 cups
July 20	1208	6091	1.53	....
July 27	1441	7532	1.82	....
Aug. 4	2267	9799	2.67	28 cups

The foregoing table gives the oleoresin yield throughout the tapping season.

The average yield of 1.53 oz. per cup per streak obtained from Western White Pine in this locality is very small compared with that of other turpentine producing pines. A slight increase in yield may be noticed toward the end of the tapping season, but even the highest amount of oleoresin obtained at the last chipping at the beginning of August, is much smaller than the average yield obtained from Western Yellow Pine in the same region.

It remains to be seen whether a low oleoresin yield is specific to Western White Pine in general, or whether it is due to the fact that this species in the Warner Mountains is growing under unfavorable conditions, being far from its environmental optimum.

OLEORESIN EXAMINATION.

Oleoresin obtained from Western White Pine has a honey-like consistence and stringy appearance. It possesses a pungent odor not similar to that of common turpentine. It does not crystallize as readily as Western Yellow Pine oleoresin, but on standing retains its stringy, viscous and homogeneous character. It resembles the oleoresin of Sugar Pine (*Pinus lambertiana*).

Four samples of the oleoresin were subjected to steam distillation for volatile oil separation as soon as they were obtained from the trees. The operation was done in a 1000-cc. round-bottom flask with a Kjeldahl connecting bulb tube placed between the flask and condenser to prevent any rosin from being carried over. After all the oil was removed the remaining rosin was heated in a paraffin bath until all water had been removed. The temperature was not allowed to rise above 145° C. The oleoresin foamed excessively on distillation with steam and the last traces of oil were removed with difficulty. Yield of oil and rosin was as follows:

Sample of Oleoresin.	Per Cent Oil.	Per Cent Rosin.	Per Cent Impurities.
June 22	20.0	78.15	1.85
June 30	15.8	82.20	2.00
July 10	18.0	79.80	2.20
July 30	19.0	79.10	1.90

The average yield of volatile oil of 18.2% might be considered very high, compared with that of other pines growing in California. The volatile oil of Western White Pine has the same pungent odor as the oleoresin, but even more penetrating.

The remainder of the oleoresin was shipped to Gainesville for chemical examination which was begun early in 1930. It had a sp. gr. by hydrometer of 1.002 at 23° C. On steam distillation in the same manner as above 7343.5 Gm. gave 1328 Gm. of oil or 18.08%. This oil was combined with that of the above 4 samples making a total of 1582.6 Gm. for investigation. The hot rosin was strained through cheese-cloth.

PROPERTIES OF THE ROSIN.

When compared with standard cubes it graded WG and by immersion in brine solution showed a sp. gr. of 1.045 at 23° C. When a melting point was taken with a Thiele tube it began to soften at 37° C. It melted at 45–49° C. and became completely liquid at 51° C. Its specific rotation in alcohol was −1.58° at 25° C. Acid value 147.3, ester value 14.9, iodine value 19.9.

ANALYSIS OF THE OIL.

Preliminary Testing.—Clear and colorless. Sp. gr. $\frac{20}{20}$, 0.8691 (by Westphal). Optical rotation α_D +20.59° at 20° C. Ind. of ref. n_d, 1.4646 at 23° C. When cooled to 5° C. over night no separation took place. Acid value 0.0, ester value 0.0. No oxygen or nitrogen compounds.

Distillation.—1582.6 Gm. of oil was distilled at 2–4 mm. making 5° cuts for the first distillation. This was then fractionated with a Vigreaux column, making the cuts as near one-degree intervals as possible. After a total of four distillations the fractions were as follows:

B. P.	Sp. Gr. $\frac{15}{15}$	Ref. Ind. n_d at 26° C.	Opt. Rot. 26° C.	Wt., Gm.
155–156 (765 mm.)	0.8734	1.4658	+13.30	48.0
156–157	0.8654	1.4638	+13.30	230.0
157–158	0.8656	1.4642	+13.30	279.3
158–159	0.8646	1.4640	+12.70	174.1
159–160	0.8674	1.4649	+11.06	98.7
160–161	0.8713	1.4667	+ 8.80	20.4
161–162	0.8817	1.4689	+ 6.95	11.2
162–163	0.8693	1.4672	+ 3.62	7.7
163–164	0.8729	1.4677	+ 0.16	8.2
43–44 (5 mm.)	0.8656	1.4641	+ 9.85	151.8
44–45	0.8610	1.4634	+ 8.38	108.3
45–46	0.8702	1.4657	+ 6.12	53.5
46–47	0.8705	1.4659	+ 4.20	18.7
47–48	0.8830	1.4681	+ 3.00	16.4
48–50	0.8830	1.4658	+ 2.25	14.8
50–51	0.8679	1.4644	+ 3.25	8.8
51–52	0.8808	1.4664	.....	3.1
52–54	0.8579	1.4624	.....	3.5
54–55	0.8928	1.4681	+ 3.25	13.3
55–61	0.8499	1.4553	.....	3.1
61–68	0.8816	1.4603	.....	6.1
68–75	0.8390	1.4475	− 2.20	26.0
75–85	0.8719	1.4538	+ 5.40	7.1
85–90	0.8965	1.4668	+10.05	11.4
90–95	0.9375	1.4797	+17.68	13.0
95–100	0.9659	1.4888	+22.40	6.6
100–105	0.9615	1.4938	+19.50	10.8
Near 105	0.8829	1.4554	− 1.50	10.8
Residue	....	1.5001	.....	23.1
			Total	1387.8

While distilling over the last fraction (near 105) the contents of the flask exploded which might be attributed to sudden polymerization. As indicated by the sp. gr. not running uniform, the oil appears to have one or more terpenes that polymerize easily (phellandrene ?). Because of this it would be difficult to estimate the % of sesquiterpenes which we would expect in the last four fractions.

The sp. gr. was taken by a Mohr-Westphal balance or a 4-cc. pycnometer when the quantity was not sufficient. Determinations were taken at 25° C. and corrected to $\frac{15}{15}$, using a correction of 0.00075 per degree.

IDENTIFICATION OF CONSTITUENTS.

d-α-Pinene.—The physical properties of the fraction boiling at 156–157° C. and the nitrosyl chloride derivative proved the presence of *d-α*-pinene. The pinene nitrosyl chloride was prepared by the method of Wallach. It formed with ease and abundance and melted at 108° C. Taking the first five fractions as *d-α*-pinene the oil contains approx. 59.8% of this constituent.

β-Pinene.—Using 12 cc. of the fraction 43–44° C. (5 mm.), nopinic acid was prepared according to the method of Wallach. It melted at 112° C. but recrystallization raised it to 126° C. The physical properties are in close accordance with those recorded for β-pinene. Taking the seven fractions from 160–161° C. to 45–46° C. (5 mm.) as β-pinene the oil contains approx. 26% of it.

Limonene.—Before fractionation the oil had an odor reminding one of limonene. The fractions boiling between 50° C. and 75° C. (at 5 mm.) had a more distinctive odor of it, but its tetrabromide could not be obtained. It is possible that the decrease in rotation changing to lævo and then to dextro again is due to *l*-limonene.

The fractions boiling between 46° C. and 55° C. (5 mm.) were treated with dry HCl gas for sylvestrene and N_2O_3 for the nitrosite of phellandrene but the results were negative.

The remaining fractions stood for 12 months before the investigation could be continued. They were kept in well-filled test-tubes protected from light.

N-Undecane.—The fraction 68–75° C. (5 mm.) weighing 26.0 Gm. was distilled over metallic sodium at 766.6 mm. giving the following fractions:

B. P.	Sp. Gr. $\frac{15}{15}$	Ref. Ind. n_d at 27° C.	Wt. in Gm.
160–170	....	1.4490	2.0
170–175	....	1.4475	2.4
175–180	0.8174	1.4452	4.5
180–185	0.8063	1.4409	3.6
185–190	0.7803	1.4405	9.0

The last fraction (185–190) showed such a low sp. gr. and index of refraction that a paraffin hydrocarbon was suspected. 5 cc. of it was treated with fuming H_2SO_4 in accordance with the U. S. P. X test for kerosene in oil of turpentine. After centrifuging, 2.5 cc. remained as a clear top layer. In order to get more of this hydrocarbon for identification the remaining fractions between 60° C. and 90° C. (5 mm.) were treated in a similar manner and combined giving a total of 14.5 cc. In each case the H_2SO_4 treatment was continued until the oil no longer imparted a color to the acid. The hydrocarbon was washed with aqueous K_2CO_3 and dried over metallic sodium.

The boiling point was determined by distilling 10 cc. in a 15-cc. distilling flask, using an asbestos heating board, asbestos wrapping around the neck of the flask, a direct flame and a standardized Anschutz thermometer. The liquid was brought to boiling with the thermometer immersed in it. In this way the thermometer registered approx. 195° C. This was continued for several minutes and then the heat increased to such a point that the liquid would distil over at the rate of 30 drops per minute. The thermometer was then raised so that the center of the bulb was opposite the bottom of the side exit tube. 9 cc. distilled over between 196.3

and 197.9° C. (corr.) at 761.4 mm. The distillation was stopped at this point to prevent superheating. The residue in the flask showed no discoloration.

The sp. gr. was taken (before the b. p.) in an 8.5-cc. Sprengel tube giving the following results:

at $\frac{15}{15}$, 0.7457; at $\frac{15}{4}$, 0.7451; at $\frac{20}{20}$, 0.7432; at $\frac{20}{4}$, 0.7422; at $\frac{25}{25}$, 0.7407.

The melting point of the paraffin compound was taken as follows: 13 cc. in a $^1/_2$-oz. prescription bottle was frozen by solid CO_2 and alcohol. A pentane thermometer was immersed in it during freezing. It solidified at approx. −26° C. The temperature of the bath was allowed to raise slowly. So determined, the m. p. was −26.1 to −25.8° C.

The index of refraction was taken at three different temperatures. The average of five readings at each temperature follows: n_d at 15° C., 1.4210; n_d at 20° C., 1.4193; n_d at 25° C., 1.4171.

The rotation in a 10-mm. tube was zero.

A cryoscopic molecular weight determination in benzol gave 155.1. Required for $C_{11}H_{24}$ 156.2.

Of the paraffin hydrocarbons having this empirical formula only one corresponds in above physical properties, *viz.*, *n*-undecane. Branched compounds would naturally have a lower b. p. So far as we are aware *n*-undecane has heretofore been identified only in the oleoresin of *Pinus excelsa* (2) and Pennsylvania petroleum (6).

The physical constants of this compound were recently determined by Shepard, Henne and Midgley (7). The source of their compound was petroleum. Inasmuch as it is exceedingly difficult to separate and purify the constituents of petroleum, *Pinus monticola* would seem to offer a good source of *n*-undecane for such a study.

Sesquiterpenes.—Present but none identified. Polymerization prevents a determination of their %.

SUMMARY.

The oloresin of *Pinus monticola* Dougl., obtained from trees growing under unfavorable conditions in the Warner Mountains of California, has been investigated. The environment of the trees is described. Details of the oleoresin extraction are given, supplemented by tables of yield for oleoresin, oil and rosin. The properties of each are described. The oil contains *d*-α-pinene, 60%; β-pinene, 26%; *n*-undecane, 1–2%; and sesquiterpenes. Limonene is perhaps present.

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DETERMINATION OF THE REASONABLE OR PERMISSIBLE MARGIN OF ERROR IN DISPENSING.

BY MARVIN J. ANDREWS.

(*Continued from page 763.*)

TABLE VI.—SUMMARY OF RESULTS.

Prescription Number.	Average S. D.	Number of Batches of Powders Falling within 1 × S. D.	2 × S. D.	3 × S. D.	Percentage of Batches of Powders Falling within 1 × S. D.	2 × S. D.	3 × S. D.
1	0.345	14	16	.	46.66	53.33	...
2	0.185	16	14	.	53.33	46.66	...
3	0.525	16	14	.	53.33	46.66	...
4	0.574	16	13	1	53.33	43.33	3.33
5	0.696	17	12	1	56.66	40.00	3.33
6	0.294	17	10	3	56.66	33.33	10.00
7	0.186	17	13	.	56.66	43.33	...
8	0.228	35	23	2	58.33	38.33	3.33
9	0.523	35	19	8	55.00	31.66	13.33
10	0.526	29	31	.	48.33	51.66	...
11	0.185	38	20	2	63.33	33.33	3.33
	Totals	248	185	17	55.11	41.11	3.77

An examination of the table shows that 96.22 per cent (55.11 per cent + 41.11 per cent) of a total of 450 batches of powders filled fall within twice the standard deviation for weight. So far as the prescriptions used in these tests are concerned, therefore, this deviation might well be taken as defining the limit for reasonable or permissible error.

CAPSULES.

Capsules are prepared in much the same way as powders, hence the possibilities to err may be expected to be the same. This is demonstrated to be true by the results of the tests reported herein. The preparation of capsules, however, presents an additional opportunity to err in that the bulk material must be filled into the capsules. In some instances, a division of the

bulk material is effected by one of the methods employed for powders before filling into the capsules, but in the majority of cases, the capsules are filled directly from the bulk material, especially where the latter is a powder. The *modus operandi* of filling is, therefore, an important factor in this connection. As in the case of powders, a variety of procedures for preparation has been suggested. For the purposes of this study, however, only those methods generally employed in actual practice were used. They are as follows:

1. Filling directly from the bulk material, which is usually accomplished by repeatedly pressing the smaller shell, or body of the capsule, into the material until filled. In the case of non-adhesive powders, the material is pushed into the shell with a spatula.

2. Filling as described above after dividing the bulk material by the blocking method described under powders.

3. Filling by weight, which consists of packing the material into the capsule until the desired weight is attained.

In this series of tests, 8 different prescriptions were filled. As in the case of powders, they were selected with a view to determining not only the frequency and magnitude of error traceable to the principal operation involved, but also the extent to which other factors contributed to the total.

No. 12.

Hydrarg. Chlor. Mit.	gr. ii
Lactos.	gr. iv
M. et ft. caps. No. 1	
D. t. d. No. viii	
Sig: One every 15 min.	

No. 13.

Ext. Gentian.	℈i
Ext. Nuc. Vom.	
Ext. Hyoscy. aa.	gr. iv
Ft. caps. No. viii	
Sig: One every 4 hrs.	

No. 14.

Phenyl. Salicyl.	
Acetphen.	
Camph. Monobrom. aa.	gr. xii
Quin. Sulph.	℈i
Ft. caps. No. xv	
Sig: One every 3 hrs.	

No. 15.

Ol. Menth. Pip.	gtt. 1/16
Sod. Salicyl.	gr. v
Ft. caps. No. i	
D. t. d. No. xvi	
Sig: One capsule every 3 hrs.	

No. 16.

Pulv. Capsic.	gr. v
Phenyl. Salicyl.	℥i
Quin. Sulph.	gr. x
M. et ft. caps. No. xii	
Sig: One capsule t. i. d.	

No. 17.

Strych. Sulph.		
Arsen. Triox.	aa.	gr. i
Quin. Sulph.		
Carbo. Lig.	aa.	℥ss
Ft. caps. No. xxiv		
Sig: A capsule t. i. d.		

No. 18.

Ext. Bellad. Fol.		
Ext. Cannab.	aa.	gr. i
Acetphen.		
Acetanil.	aa.	gr. xxiv
M. et div. in caps. No. xii		
Sig: One capsule every 3 hrs. p. r. n.		

No. 19.

Cret. Præp.	℥i
Mag. Oxid.	℥i
Phenolphthal.	gr. iv
Ft. caps. No. xii	
Sig: One t. i. d.	

PRESCRIPTION NO. 12.

Prescription No. 12, the first of the capsule prescriptions worked upon, was filled by the same group of students that filled prescription No. 1 for powders, both being filled during the same laboratory period. In both instances, the students were unaware that the prescriptions were to be examined in any manner other than that regularly employed in the laboratory. These prescriptions were examined for errors in weight, and 10 batches selected at random from the 30 batches of 8 capsules each were assayed for calomel content. The degree of accuracy attained is shown in the following tables:

TABLE VII.—PRESCRIPTION NO. 12 (CORRECT WEIGHT OF EACH CAPSULE = 6 GRAINS).

Batch No.	Weight of Each Capsule in Grains. 1.	2.	3.	4.	5.	6.	7.	8.	Total Wt. in Grains.	Av. Wt. in Grains.	S. D.[1]
1	5.875	5.875	6.000	6.125	6.000	6.000	6.125	5.875	47.875	5.984	0.075
2	5.875	6.000	6.000	6.125	6.000	6.125	6.125	5.750	48.000	6.000	0.124
3	6.500	6.375	6.250	6.500	6.125	6.000	7.000	5.750	50.500	6.310	0.353
4	5.875	6.625	6.375	6.000	5.750	5.875	7.000	5.625	49.500	6.197	0.451
5	5.875	5.750	6.000	6.125	5.750	5.875	6.250	5.625	47.250	5.906	0.195
6	5.875	5.750	5.625	6.000	5.750	5.875	6.375	5.625	46.875	5.859	0.228
7	5.875	5.875	5.875	5.875	6.000	5.875	5.125	5.750	47.250	5.906	0.103
8	6.125	6.375	5.875	6.000	6.250	5.750	6.000	5.750	48.125	6.015	0.211
9	5.625	5.750	5.875	6.000	6.000	6.000	6.125	4.500	45.875	5.734	0.440
10	6.000	6.000	6.250	6.500	6.375	6.250	6.500	6.000	49.875	6.234	0.201
11	5.875	6.000	5.875	6.000	6.125	6.000	6.250	5.875	48.000	6.000	0.124
12	6.125	6.000	6.250	6.500	6.375	6.250	6.500	6.125	50.125	6.265	0.170
13	6.250	6.125	6.125	6.000	5.750	6.000	6.250	5.250	47.750	5.968	0.310
14	6.000	6.000	6.000	5.875	6.125	6.125	6.125	5.000	47.250	5.906	0.352
15	5.500	6.375	5.875	6.250	6.000	5.875	6.125	5.750	47.750	5.968	0.263
16	6.500	6.000	6.125	5.750	6.125	6.000	5.875	6.125	48.500	6.063	0.207
17	6.250	6.250	6.375	5.875	6.000	6.125	6.625	5.625	49.125	6.140	0.295
18	6.500	5.500	5.750	5.750	5.750	6.250	6.500	5.125	47.125	5.891	0.456
19	6.125	6.250	6.250	6.375	5.750	6.000	5.875	6.000	48.625	6.078	0.197
20	5.750	6.250	6.000	6.125	6.125	6.000	6.375	5.250	47.875	5.984	0.327
21	5.875	6.125	6.125	6.250	5.750	5.875	6.250	6.375	48.625	6.078	0.206
22	6.000	5.750	6.000	5.750	6.125	6.000	6.250	6.125	48.000	6.000	0.165
23	6.375	6.250	6.125	5.625	6.000	5.500	5.875	5.500	47.250	5.906	0.317
24	5.500	6.500	5.625	5.875	6.250	6.125	6.000	6.000	48.875	5.984	0.302
25	5.250	6.125	5.750	6.000	5.875	6.250	6.500	5.125	46.875	5.859	0.443
26	5.750	5.875	5.875	6.250	6.125	6.125	6.250	5.375	47.625	5.953	0.278
27	6.375	5.750	6.000	6.250	6.000	6.125	6.375	5.125	48.000	6.000	0.385
28	5.625	5.875	5.750	5.500	6.000	5.500	6.000	5.375	45.625	5.703	0.224
29	5.875	6.000	6.000	6.000	6.000	6.000	6.125	5.500	47.500	5.937	0.176
30	5.750	5.625	5.875	5.875	5.750	5.875	6.000	5.375	46.125	5.766	0.181

[1] Av. S. D. = 0.258, which is equivalent to an average deviation from the theoretical of 4.30%.

TABLE VIII.—PRESCRIPTION NO. 12 (CORRECT PERCENTAGE OF CALOMEL = 33.33).

Batch No.	Per Cent of Calomel in Each Capsule. 1.	2.	3.	4.	5.	6.	7.	8.	Average Per Cent.	S. D.[1]
1	34.31	33.80	34.46	33.46	33.08	34.57	32.51	35.23	33.93	0.980
2	34.71	32.65	28.34	32.65	28.34	33.32	33.35	34.32	32.21	2.310
3	34.23	33.30	29.38	33.75	31.39	25.26	29.86	30.59	30.97	2.540
4	33.27	34.00	33.12	33.86	33.15	33.25	33.36	33.37	33.42	0.306
5	28.90	29.20	28.83	28.82	28.69	30.44	30.40	31.08	29.55	0.878
6	35.27	36.05	36.08	35.18	34.93	35.06	36.92	38.82	36.04	1.220
7	33.28	32.64	33.75	34.75	33.09	32.61	34.04	34.46	33.58	0.753
8	31.44	31.00	31.08	33.15	29.19	31.15	30.90	32.26	31.27	1.060
9	36.08	36.67	36.45	35.76	37.39	35.55	36.92	34.49	36.16	0.854
10	32.00	33.50	33.75	32.89	32.50	33.25	33.35	33.65	33.11	0.568

[1] Av. S. D. = 1.15, which is equivalent to an average deviation from the theoretical of 3.44%.

With respect to the weight of the capsules filled Table VII shows the average standard deviation to be 0.258 grains, or 4.30% of the prescribed amount. Sixteen of the 30 batches filled fall within the average S. D. and the remaining 14 fall within twice the average S. D.

In the case of the calomel content, the average standard deviation amounts to 1.147 per cent based on a theoretical calomel content of 33.33 per cent. Seven of the 10 batches fall within the average S. D. and the remaining 3 fall within twice the average S. D. The comment made under the prescription for calomel powders applies equally as well in this instance.

PRESCRIPTIONS NOS. 13–19.

The remaining 7 prescriptions were only examined for errors in weight. Before giving them out to be filled, the students were instructed as to the method to be followed, and they were told that their work would be checked for accuracy.

The extent to which each of the following factors contributed to the total error is shown in Tables IX and X: Nature and number of ingredients, number of capsules in each batch, amount of material in each capsule and *modus operandi* of filling.

TABLE IX.—STANDARD DEVIATION OF PRESCRIPTIONS NOS. 13–15.

Batch No.	Prescriptions. No. 13.	No. 14.	No. 15.
1	0.260	0.296	0.255
2	0.222	0.268	0.405
3	0.408	0.280	0.330
4	0.255	0.346	0.196
5	0.148	0.270	0.170
6	0.247	0.097	0.302
7	0.401	0.254	0.223
8	0.240	0.348	0.211
9	0.152	0.167	0.192
10	0.386	0.466	0.206
11	0.411	0.357	0.176
12	0.404	0.154	0.338
13	0.348	0.422	0.220
14	0.168	0.394	0.264
15	0.178	0.408	0.357
16	0.327	0.464	0.344
17	0.325	0.261	0.376
18	0.108	0.328	0.337
19	0.257	0.103	0.260
20	0.434	0.406	0.346
21	0.088	0.374	0.264
22	0.211	0.391	0.204
23	0.430	0.478	0.356
24	0.410	0.425	0.175
25	0.356	0.151	0.384
26	0.153	0.220	0.303
27	0.192	0.414	0.383
28	0.388	0.456	0.166
29	0.396	0.437	0.374
30	0.273	0.334	0.207
Av. S. D. =	0.286	0.326	0.277
Av. % =	8.17	8.73	5.47

The extent to which the *modus operandi* of filling capsules affects the final error is comparable to that observed in the case of powders; and as in the case of powders, the method in which the individual doses are divided off by weighing is the most accurate. This is clearly shown in the results obtained for prescription No. 16 in which 22 of the 40 batches of capsules filled fall within the average S. D. and the remaining 18 within twice the average S. D.; and in prescription No. 17, in which 25 of the 40 batches of capsules filled fall within the average S. D. and the remaining 15 within twice the average S. D.

TABLE X.—STANDARD DEVIATION OF PRESCRIPTIONS NOS. 16–19.

Batch No.	Prescriptions. No. 16.	No. 17.	No. 18.	No. 19.
1	0.256	0.261	0.138	0.522
2	0.506	0.234	0.348	0.145
3	0.215	0.307	0.153	0.332
4	0.147	0.325	0.246	0.668
5	0.454	0.212	0.419	0.395
6	0.258	0.118	0.130	0.403
7	0.144	0.235	0.180	0.669
8	0.236	0.247	0.294	0.068
9	0.305	0.259	0.154	0.324
10	0.088	0.235	0.271	0.373
11	0.464	0.225	0.141	0.411
12	0.046	0.254	0.200	0.645
13	0.104	0.195	0.274	0.593
14	0.252	0.144	0.415	0.395
15	0.080	0.209	0.263	0.148
16	0.213	0.346	0.292	0.320
17	0.421	0.263	0.322	0.141
18	0.483	0.347	0.204	0.218
19	0.316	0.128	0.281	0.161
20	0.374	0.275	0.410	0.359
21	0.114	0.416	0.129	0.038
22	0.072	0.382	0.332	0.310
23	0.374	0.299	0.293	0.642
24	0.054	0.401	0.360	0.621
25	0.438	0.207	0.229	0.142
26	0.443	0.405	0.405	0.636
27	0.061	0.267	0.339	0.510
28	0.325	0.427	0.366	0.204
29	0.207	0.330	0.294	0.524
30	0.210	0.416	0.413	0.518
31	0.314	0.260	0.322	0.512
32	0.425	0.243	0.130	0.552
33	0.318	0.218	0.342	0.609
34	0.207	0.461	0.134	0.484
35	0.243	0.454	0.421	0.791
36	0.252	0.275	0.417	0.574
37	0.350	0.108	0.335	0.528
38	0.117	0.242	0.144	0.196
39	0.284	0.475	0.416	0.625
40	0.135	0.204	0.195	0.448
Av. S. D. =	0.257	0.283	0.279	0.419
Av. % =	4.11	10.95	6.69	4.05

The method of blocking and dividing is next in accuracy, as shown by the results obtained for prescription No. 13. In this instance, 16 of a total of 30 batches fall within the average S. D., and the remaining 14 fall within twice the average S. D. The results obtained for prescription No. 15 are similar in character and furnish added proof of the correctness of the above statement.

The method in which the capsules are filled by packing directly from the bulk material is the least accurate of the methods tested. This is shown to be true by the results obtained for prescription No. 14 in which case 12 of a total of 30 batches fall within the average S. D., while 18 fall within twice the average S. D. Further proof for the correctness of this statement is furnished by the results obtained for prescription No. 18.

The nature of the ingredients of the prescription is a factor responsible for a part of the total error. This is shown by the results obtained for prescriptions Nos. 13 and 15.

Likewise, the number of ingredients is a factor to be reckoned with. The greater the number of ingredients, the greater the number of weighings and transfers, each of which presents opportunities to err. This is shown to be true by results obtained for prescriptions Nos. 12, 13, 14 and 18.

The magnitude of the error made seems to depend to some extent on the number of capsules in each batch. Apparently, the greater the number of capsules filled, the greater the chance for error. This is shown by results obtained for prescriptions Nos. 12, 13, 14, 15, 16 and 18.

The effect of weight of the contents of individual capsules on the final error is of the same general order as that observed in the case of powders. Likewise, as in the case of powders, the average S. D. increases as the weight increases, whereas the percentage deviation from the theoretical amount decreases, correspondingly. This is shown in the table immediately following.

TABLE XI.—EFFECT OF WEIGHT OF INDIVIDUAL CAPSULES ON STANDARD DEVIATION.

Prescription Number.	Theoretical Weight of Each Capsule in Grains.	Average Standard Deviation.	Percentage Deviation from the Theoretical.
17	$2^1/_2$	0.283	10.95
13	$3^1/_2$	0.286	8.17
15	5	0.277	5.47
16	$6^1/_4$	0.257	4.11
19	$10^1/_3$	0.419	4.05

TABLE XII.—SUMMARY OF RESULTS.

Prescription Number.	Average S. D.	Number of Batches of Capsules Falling within 1 × S. D.	Number of Batches of Capsules Falling within 2 × S. D.	Percentage of Batches of Capsules Falling within 1 × S. D.	Percentage of Batches of Capsules Falling within 2 × S. D.
12	0.258	16	14	53.33	46.66
13	0.286	16	14	53.33	46.66
14	0.326	12	18	40.00	60.00
15	0.277	16	14	53.33	46.66
16	0.257	22	18	55.00	45.00
17	0.283	25	15	62.50	37.50
18	0.279	18	22	45.00	55.00
19	0.419	20	20	50.00	50.00
Totals		145	135	51.76	48.21

The results obtained with prescriptions calling for capsules are summarized in Table XII. It will be observed that they are almost identical with those obtained for powders, so that further comment is unnecessary. Twice the standard deviation was suggested as the limit of reasonable or permissible error for the preparation of powders, and since all batches of the capsules prepared fall within this limit, the acceptance of the same standard would appear to be justified.

(To be continued)

METHYLATED SPIRIT DRINKING IN SCOTLAND.

The magistrates of Glasgow resolved to suggest to the Secretary of State for Scotland that legislation should be introduced to have the sale of methylated spirits more strictly controlled than it is to-day. The object in view is the repression of methylated spirits drinking, which has come to be a very great evil in the city.

On the motion of Bailie John Henderson, the magistrates unanimously adopted a suggestion made by the Chief Constable, and instructed the Town Clerk to draft representations to lay before the Secretary of State for Scotland in favor of legislation under which methylated spirits would be included in the category of a poison within the meaning of the Dangerous Drugs Act, or that at all events the right of sale would be vested only in fully qualified chemists.

SYRUP OF TOLU.

BY J. A. W. LUCK.

The freshly prepared syrup of tolu made by the U. S. P. X process has a yellow color. On standing the syrup darkens, not infrequently becoming dark brown if the syrup is kept for a period of months. Curiously the syrups of tolu dispensed by some pharmacists are colorless and insipid liquids. These syrups are usually slightly acid and are decidedly inferior in odor and taste to those made by the official process.

Although a colorless, weakly acid syrup of tolu may be prepared comparable in odor, taste and therapeutic value to one made by the prescribed formula, it is an advantage in pharmaceutical practice to have either a neutral or slightly alkaline syrup. However, neutral and alkaline syrups of tolu are always colored, the intensity of the color increasing with an increase of the hydroxyl-ion concentration of the syrups.

Syrup of tolu contains the alcohol-water soluble constituents of balsam of tolu in the proportion of 1 Gm. of the latter to 100 cc. of the finished syrup. For the sake of convenience the official tincture of tolu is used. The syrup, therefore, contains about 4% of alcohol by volume.

The principal therapeutic agent of the official syrup is cinnamic acid in the form of its magnesium salt. The U. S. P. X does not prescribe a standard for the free cinnamic acid content of balsam of tolu. Hence, it is to be expected that great variations will be found in the cinnamic acid content of syrups of tolu obtainable

TABLE I.

	I.	II.	Color.	Litmus.	Phenol-phthal.	Conc. HCl.	Sol. NaOH.	Color on Standing.	Methyl Violet.
1	10.0	..	y	Blue	Red	Ppt. cd	Darker	.....	Bluish
2	2.0	50	y	Blue	Pink	Ppt. cd	Darker	Orange 32	Bluish
3	1.5	50	ly	Blue	nc	Ppt. cd	Darker	Orange 32	Bluish
4	1.0	50	py	Blue	nc	Ppt. cd	Darker	Yellow 32	Bluish
5	0.6	50	nc	Red	nc	Ppt. ..	Yellow	.....	Bluish
6	...	50	nc	Red	nc	.....	py	.....	Bluish
7	Fluid	Tolu	nc	Red	nc	.....	....	.....	Violet

I Mag. Carb. II Talcum, y, ly, py, yellow, light yellow, pale yellow, respectively; nc no color, cd color discharged, ppt. precipitate, 32 number of days in contact.

TABLE II.—SOLUBILITY OF CINNAMIC ACID IN ALCOHOL-WATER SOLUTIONS AT 18°–19° C.

Alcohol, % by volume..	0	1.06	3.9	5.0	10.0	15.0	20.0	24.7	27.2	30.1
Cinnamic acid, Gm. per L. sol.....	0.417	0.43	0.5	0.53	0.58	0.73	0.92	1.18	1.5	1.84
Total HCl in Gm. per L. sol.....	.....	....	...	....	9.71	9.86	10.05	10.31	10.63	10.97

in the open market. Tschirch (1), Vezes et Dupont (2) and Dieterich (3) all state that balsam of tolu contains from 12 to 15% of free cinnamic acid. The latter calls attention to a steady decrease in the free cinnamic acid content of balsams of tolu delivered in the Hamburg market. Hager (4) as well as Tschirch (1) refer to the work of Spillsbury and Joyce who state that good balsam of tolu contains at least 18% of free cinnamic acid. The latter figure is also given by the National Dispensatory.

The magnesium carbonate of the official process serves a twofold purpose. It acts as an adsorbent for the water-insoluble portion and reacts with the free acids of the balsam to form the more soluble magnesium salt. Calcium phosphate, talcum (5) and fine sand are also used as adsorbents. The syrups made by using the latter three are merely flavored sugary solutions of the free acids. Nothing seems to have been published about the coloring substance of syrup of tolu. This substance is colorless in acid solutions and yellow in alkaline solutions.

Many manufacturers of pharmaceuticals market a preparation called "Fluid Tolu Soluble." This product when mixed with simple syrup is supposed to give the official syrup. Lately, some manufacturers have omitted the word official. The fluids tolu soluble are, therefore, concentrated solutions of the hydro-alcoholic soluble components of the balsam. These concentrated solutions are mostly colorless and yield syrups whose color does not change on standing. They are, however, deficient in both odor and taste. Examination of the catalogs of various manufacturers reveals a lack of uniformity in the alcohol content and in the proportion of mixing of the fluid tolus with the simple syrup. All of these concentrations give syrups of a lower alcohol content than the official syrup. Still greater differences are noticeable when a fluid of tolu, is compared with the filtrate obtained by the official procedure. The comparison was extended to include solutions made with smaller quantities of magnesium carbonate together with talcum and talcum alone. All of these were prepared without sugar. In some of these tests the mixtures were kept unfiltered for one hour to four weeks. The fluid of tolu tested was labeled to contain 27% of alcohol by volume. The results are listed in Table I.

These tests show that the concentration and intensity of the dissolved coloring substance is a function of the hydroxyl-ion concentration. The coloring substance is slightly soluble in weakly acid solutions in its colorless form. These solutions become colored upon the addition of an alkaline solution.

The coloring substance is abstracted from both the acid and alkaline solutions by wool. When this wool is dyed with methyl violet it takes on a bluer shade than wool dyed with methyl violet only. A few drops of a solution of methyl violet added to the solutions enumerated in Table I impart to them a color which is blue by transmitted light and turbid coppery by reflected light. The turbidity is greatest in alkaline solutions from which the coloring matter soon precipitates. In weakly acid solutions the blue color is noticeable only by comparing it with the color of an equal quantity of methyl violet in distilled water. When to one drop of tincture of tolu, diluted with alcohol, water is added until the solution becomes but slightly turbid, the addition of methyl violet solution and one drop of solution of sodium hydroxide produces a red color which turns blue upon the addition of a large quantity of water. This change in the color of the methyl violet is probably due to the adsorption of the yellow coloring substance of the solutions tested by the methyl violet.

Many other substances have a similar effect upon methyl violet. Dilute solutions of *p*-nitrophenol, picric acid, 3,4-nitrochlorbenzenesulphonic acid, salicylic acid and anilin appear bluish to a greater or lesser degree upon the addition of methyl violet. Neither solutions of cinnamic, gallic and tannic acid nor nitrobenzene give such a color change. A saturated solution of picric acid to which methyl violet has been added forms a precipitate which upon dispersing by shaking appears

green by transmitted light. Upon diluting this mixture with a large quantity of water the transmitted light becomes blue.

The fluid tolu soluble compared with the solutions listed in Table I shows a somewhat similar behavior as Solution 6 in which only talcum was used as the adsorbent. The latter solution may be considered as a saturated solution of cinnamic acid containing in addition small quantities of odor and taste-bearing substances, a coloring substance in its colorless form and approximately 8.3% of alcohol by volume. However, the fluid tolu contained 27% of alcohol and was labeled to give the official syrup in the proportion of 1 to 20 parts of the finished syrup. Therefore, it should be over nine times stronger than the solution obtained by the official process. Consequently, by the addition of conc. HCl a voluminous precipitate of cinnamic acid should be formed. The absence of a precipitate and the lack of color changes by the addition of methyl violet and alkali solutions casts a doubt upon the origin of this fluid tolu.

The solubility of a substance in water is usually considerably changed by the addition of other soluble substances. This change in solubility may be calculated when the physical constants involved are known. The change in solubility of a substance by the addition of a small quantity of another is frequently very small and for practical purposes may be neglected. Thus, it will be assumed that the maximum amount of cinnamic acid and magnesium cinnamate contained in the fluid tolu is identical with their solubility in an alcohol-water mixture of similar alcoholic content. Since no solubility data of either cinnamic acid or magnesium cinnamate in alcohol-water mixtures have been published, these were determined at a temperature between 18° and 19° C. As no thermostat was available the solutions were kept in a closet which was known to have a fairly constant temperature. After two weeks during which the solutions were shaken frequently, the solutions containing some of the solid phase were transferred to a room the temperature of which was practically constant. The temperatures of the room and of the solutions were observed frequently and after two hours the solutions were filtered into dry flasks. The concentrations of the filtered solutions were determined as time presented itself. The solubility of each in commercial distilled water was also determined.

The solubility of HCin in water at varying temperatures was determined by Mayer (6) who found the values at 18° and 25° C. to be 0.420 and 0.546 Gm., at 25° C. by Loevenharz (7) as 0.491 Gm. and by Larsson (8) as 0.495 Gm., all per l. of solution. The dissociation constant at 25° C. was determined by Ostwald (9) as $3.55\ 10^{-5}$ and by Larsson (10) as $3.8\ 10^{-5}$. Since the dielectric constant of alcohol is less than that of water it follows that the ionization of substances in alcohol-water mixtures decreases with the increase in the alcohol concentration of the solution. This effect is largely eliminated by diluting the solution with a large volume of water.

The required indicator for the titration of HCin may be calculated by considering the base, salts and the colored form of the indicator completely ionized. At the end-point the rates of reaction between the base and the indicator and the salt of the indicator and the acid should be equal. Therefore $k_i/k_w = k_a/k_i$ or $k_i^2 = k_a k_w$, where k_i^2 is the indicator constant and k_a and k_w are the dissociation constants of the acid and water, respectively. Substituting the proper values

in the above equation and writing it in the form $pk_i = {}^1/_2(pk_a + pk_w) = 18.45/2 = 9.23$ the required indicator constant is determined. Phenolphthalein may therefore be used as the indicator in the titration of HCin. The solutions were titrated with a $0.1125N$ solution of sodium hydroxide. The alcohol effect was practically eliminated by diluting the solutions so that the alcohol content was less than 2.5% by volume. The results are represented in Table II and graphically by the solubility Curve A.

Magnesium cinnamate is the salt of a weak acid and base, and since HCin is quite volatile, it cannot be prepared by the evaporation of its aqueous solution by means of heat. It may, however, be made easily by the interaction of a solution of an alkali cinnamate with a concentrated solution of a magnesium salt, provided that the resulting salts are more soluble than the magnesium cinnamate. Nearly complete separation may be attained if the mol concentration of the alkali cinnamate is small compared to that of the magnesium salt.

Beilstein (11) lists three salts each with 1, 2 or 3 molecules of water of crystallization. Tarugi and Checchi (12) refer to a salt containing 3 molecules of water, but do not give its method of preparation. Ephraim and Pfister (13) prepared a salt containing 4 molecules of water by adding $MgSO_4$ to a solution of NaCin. The solubility of this salt in water was determined by them at 20° C. as 12.25 Gm. per L. of solution.

For the determination of the alcohol-water solubility of magnesium cinnamate a sufficient quantity of it was prepared by adding a solution NaCin equivalent to 8 Gm. HCin to a saturated solution containing 240 Gm. of $MgSO_4$-$7H_2O$, stirring the solution rapidly. Crystals of magnesium cinnamate appeared immediately. After standing for some time the crystals were transferred to a filter, washed several times with ice cold water and finally with alcohol. The crystals were dried between filter paper at room temperature and transferred after three days to a glass-stoppered bottle.

This magnesium cinnamate crystallized in the form of small white, odorless and tasteless leaflets. Upon analyzing 0.113 Gm. of this salt for magnesium by the pyrophosphate (14) method it yielded 0.0321 Gm. of $Mg_2P_2O_7$. This corresponds to 0.1126 Gm. of magnesium cinnamate of the formula $Mg(Cin)_2$-$4H_2O$. It is, therefore, identical to the salt prepared by Ephraim & Pfister (13).

The solutions of this salt in water and alcohol-water yielded upon analysis nearly identical quantities of $Mg_2P_2O_7$. The average of all of the 5-cc. solutions was 0.0172 Gm. of $Mg_2P_2O_7$. This is equivalent to 12.07 Gm. of $Mg(Cin)_2$-$4H_2O$ per L. of solution. The solubility of this salt in alcohol-water solutions up to 30% of alcohol by volume is the same as that in water. Magnesium benzoate is also similarly soluble in both solvents.

The above result was checked by titrating the solutions of $Mg(Cin)_2$ with a standard solution of HCl. In the reaction

$$Mg(Cin)_2 + 2HCl = MgCl_2 + 2HCin$$

at completion both $MgCl_2$ and HCin are present in the solution. When 5 cc. of a saturated solution of $MgCin_2$ at 20° C. is diluted to a volume of 50 cc. the concentration of the solution becomes $6.28\ 10^{-3}$ Gm. equivalents. Since the solubility of HCin at the same temperature is $2.82\ 10^{-3}$ Gm. equivalents, upon the addition

of HCl solid cinnamic acid separates from the solution. The H^+ concentration of a saturated aqueous solution of HCin may be computed by means of the relation $H^+ = (k_a c_a)^{1/2}$ and is $3.16\ 10^{-4}$ Gm. equivalents per L. of solution.

The magnesium chloride formed in the reaction decreases the solubility of the cinnamic acid. The consequent reduction of the H^+ concentration of the solution is offset by the hydrolyses of the Mg^{++} according to the equation

$$Mg^{++} + 2H_2O = Mg(OH)_2 + 2H^+$$

The degree of hydrolyses of $MgCl_2$ at a dilution of 16 L. per mol. was determined at 100° C. by Kullgren (15) as $2.66\ 10^{-3}$ % per mol. Data for lower temperatures do not seem to have been published. As an approximation it may be assumed that the salting out effect of the $MgCl_2$ is nearly compensated by its hydrolyses so that the H^+ concentration of the solution at the end-point of the titration is about that of a saturated solution of HCin. The indicator constant of methyl orange

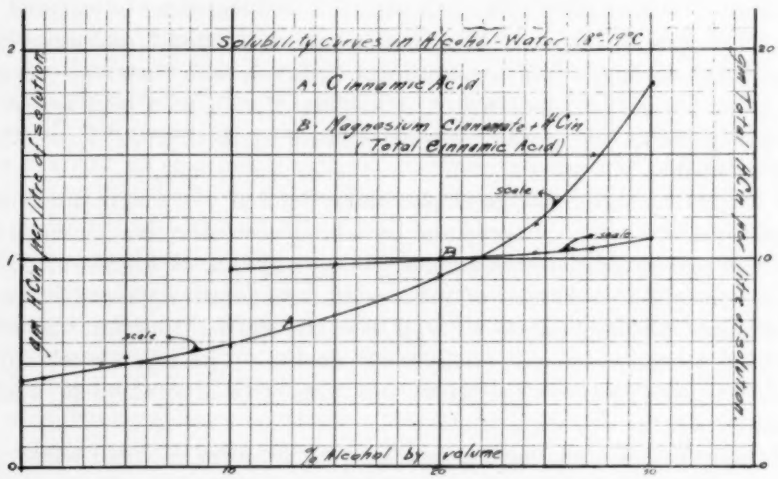

Fig. 1.

is 5.10^{-4}, consequently the H^+ concentration of $3.16\ 10^{-4}$ is equivalent to 60% of a conversion of the color of methyl orange from yellow to red. To facilitate the detection of the end-point a color standard was prepared by dissolving a small quantity of cinnamic acid in alcohol adding the required amount of indicator and diluting to 50 cc. with water. The separated HCin adsorbs a large portion of the methyl orange necessitating the addition of a larger quantity of this indicator.

In the titrations 5- and 10-cc. portions of the solutions were diluted to 50 cc. and titrated with a 0.1185*N* HCl solution. Each 5 cc. required 2.6 cc. of the acid which is equivalent to 12.03 Gm. of $MgCin_2$-$4H_2O$ per L. of solution. This corresponds to 9.13 Gm. of HCin. The previously found value by the pyrophosphate method is 12.07 Gm. $MgCin_2$-$4H_2O$.

The solubility of $MgCin_2$ and HCin in the presence of each other in solutions containing 10% and more of alcohol by volume is practically identical to their individual solubility. The total HCin content of such solutions may consequently be obtained by adding 9.13 Gm. to the solubility values obtained for HCin alone. This is shown in Table II and is also represented by Curve B.

From the foregoing it is now possible to calculate the maximum quantity of total HCin that may be present in the fluid tolu soluble of an alcohol content of 27% by volume. In the proportion of 1 part of the fluid to 20 parts of finished syrup, 50 cc. are required to make 1 L. of syrup. The total quantity of HCin that will dissolve in a L. of solution containing 27% of alcohol is 10.6 Gm. Therefore, the maximum amount of total HCin in 50 cc. of the fluid of tolu is 0.53 Gm. This is equivalent to a balsam of tolu containing 5.3% of free HCin. The fluid of tolu that was examined, however, did not contain $^1/_{20}$ of the theoretical amount. Some of the fluids tolu listed in the catalogs of the manufacturers are directed to be mixed in the proportion of 1 to 12 give syrups that may contain more total HCin than the former, but, not to exceed 0.83 Gm. per L. of syrup. This, then, definitely establishes the fact that at their best the fluids tolu soluble designated to be used to make the official syrup are equivalent only to those made of the poorer grades of balsams of tolu. The one fluid of tolu investigated was nearly devoid of HCin and was practically only a flavored hydro-alcoholic solution.

The addition of water to a triturated mixture of tincture of tolu and magnesium carbonate precipitates the resins, esters and most of the acid. The resins and esters are adsorbed by the magnesium carbonate and the precipitated acid forming more or less perfect diffusion cells. The number of particles within the cells depends upon the number of all particles present and the degree of trituration. The distribution of the particles between the various cells will not be uniform, and if the ratio of the magnesium carbonate to the acid is large many cells will contain only particles of magnesium carbonate. Since each cell represents an individual reaction chamber much coloring substance will be dissolved before the reaction between the acid and carbonate is completed. If an inert adsorbent is substituted for part of the carbonate the time for the completion of the reaction between the carbonate and the acid is increased.

A more satisfactory procedure to practically eliminate the coloring substance is to substitute a solution of a neutral or nearly neutral reactant and an inert adsorbent for the magnesium carbonate. The most commonly accessible substances of this type are sodium bicarbonate and talcum. Sodium bicarbonate reacts with the HCin of the balsam of tolu to form sodium cinnamate. This was introduced to the medical profession under the name of "Hetol" and was used at one time in the treatment of tubercular infections. It is freely soluble in water and in alcohol-water solutions.

In their aqueous solutions both $NaHCO_3$ and HCin are hydrolyzed and since the dissociation constant of carbonic acid $H_2CO_3 \longrightarrow H^+ + HCO_3^-$ is nearly $^1/_{100}$ that of cinnamic acid, it follows that at the completion of the reaction between $NaHCO_3$ and HCin the hydroxyl-ion concentration of the solution decreases to nearly $^1/_{10}$ of its original value. When both the acid and salt are in solution the reaction is rapidly completed. This can be accomplished by adding only sufficient water to the tincture of tolu to precipitate the resin and esters. These are adsorbed by the talcum forming nearly neutral cells instead of the distinctly alkaline ones when magnesium carbonate is used. The reaction between the bicarbonate and the coloring substance is consequently reduced to a minimum, particularly if all the operations are rapidly completed. A slight excess over the theoretical amount of sodium bicarbonate is required to bring all of the cinnamic acid into solution.

This was found to be 5% giving a factor 0.6 so that the required sodium bicarbonate may be calculated by means of the formula $x = 0.6a/10$, where a is the percentage of cinnamic acid of the balsam of tolu.

The suggested formula and procedure for syrup of tolu are

Tincture of tolu	50 cc.
Talcum	50 Gm.
Sodium bicarbonate	
Sugar	
Distilled water	*q. s.* 1000 cc.

First prepare a well-wetted folded filter, next dissolve the sodium bicarbonate in 50 cc. of distilled water calculated by the formula $x = 0.6a$, where a = % of HCin in the tincture of tolu. Triturate the talcum and tincture intimately, add 25 cc. of water triturating until a smooth mixture is formed, now add at once the solution sodium bicarbonate followed while triturating by 250 cc. of water, transfer to the filter. Wash the mortar with water and transfer to filter. When all has run through the filter add sufficient water to the filter to obtain 480 cc. of filtrate. To this add the sugar and dissolve.

The filtrate has a faintly yellowish color yielding a nearly colorless syrup. It is slightly alkaline to litmus, gives a copious precipitate with HCl, a slight yellow color with alkali solution and a bluish color with methyl violet solution. The resulting syrup has a highly aromatic odor and taste and remains nearly colorless on keeping.

SUMMARY.

Balsam of tolu contains a substance which is yellow in alkaline solutions and colorless in acid solutions. This coloring substance gives a bluish color to methyl violet solutions. It causes the darkening of the official syrup.

The fluids tolu soluble at their best are representative of the poorer grades of balsam of tolu. The one investigated proved to be a flavored alcohol-water solution.

The solubility of cinnamic acid and magnesium cinnamate in alcohol-water mixtures was determined with an accuracy sufficient for the purpose of this investigation.

A formula for syrup of tolu using sodium bicarbonate is given. It is finally suggested that a standard for the cinnamic acid content of balsam of tolu be adopted in the next revision of the Pharmacopœia.

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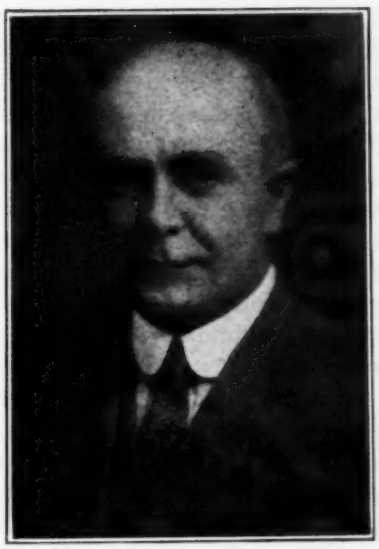
PRINCES BAY, N. Y.

ADDRESS OF THE PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.*

BY W. BRUCE PHILIP.

To the Drug World I extend greetings as President of the AMERICAN PHARMACEUTICAL ASSOCIATION at the 81st annual meeting in this eventful year of 1933. While the AMERICAN PHARMACEUTICAL ASSOCIATION shares the field of pharmacy with many other organizations, it is parent of them all. The works of each organization are well known among you and speak for efficiency and value so that I need only claim your time to give reports of the important happenings of the past year that touch the centers of our organization's existence.

My acknowledgment to many willing workers, in and out of committees, who have assisted in the accomplishments of the year's work cannot be couched in phrases, my heart says them, but my pen fails to keep step with the beats of my heart, it dictates, however, that I may heartily and simply say, as President of the AMERICAN PHARMACEUTICAL ASSOCIATION, on behalf of the ASSOCIATION and myself—I thank you, one and all.



W. BRUCE PHILIP.

My experience in Washington fully convinces me that the AMERICAN PHARMACEUTICAL ASSOCIATION is more than fortunate in having its future headquarters in the Nation's Capital.

I have found, I say it after having watched numerous appointees, that a government official after a year or two of work in a bureau or department becomes fixed in his ideas, and prejudiced in his viewpoint, and more often than not, loses the broad understanding of the outer or business world. Herein lies a great danger and I want to impress upon you its importance, I may say the necessity for self-protection and of having representation near the governmental departments.

Only through persons with pharmacy backgrounds or representatives of an industry, who can have continual and frequent contact with governmental officials is it possible to keep viewpoints on pharmacy, and drug store problems unprejudicedly before them.

I repeat, constant contact is necessary, and vital.

LEGISLATION.

It must be remembered that now most of the new laws which limit and restrict pharmacy are having their origin in some government department, and that every month or two, sometimes weekly, yes, sometimes daily, government

* Madison, Wis., August 30, 1933.

offices, such as the Pure Food and Drug Administration, the Surgeon General's office, the State Department, the Treasury Department, the Narcotic Division of the Internal Revenue Bureau, the Bureau of Industrial Alcohol, and various Sales Tax Units are making new regulations which affect seriously our business.

Every time the Government, through officials of a department, fails in a prosecution, there arises a desire in that department to change the law under which the case was tried and lost. The fact that proposed changes in the law might prove a great hardship is seldom considered. A slight change in wording of even a ruling provides loopholes for both convictions, and unhappily for technical violations which are embarrassing and expensive.

New laws, as framed by governmental departments, have two outstanding objectives.

First, to give the Department more prosecuting force and *second*, to increase the scope of the work and likewise the budget allowance of the department.

Therefore, I affirm that it is extremely necessary to have a representative (available in Washington at all times), not only do I recommend it for our own pharmacy profession but also advise it for every industry.

This process of educating of our government officials and keeping them informed, may I assure you from first-hand experience, requires diplomacy, knowledge of all facts and a willingness to listen, and a patience that must be cultivated to the *n*th degree. Not only must the heads of all departments be seen and talked to, but many subordinates must be repeatedly visited. It is well known that political appointees are often not in a branch of industry for which they have had previous training, and therefore, in order that a whole governmental department may understand all sides of any question over which they hold jurisdiction constant watchfulness is necessary.

When an understanding is reached with a governmental official, when an official finds after repeated interviews that the representative and his association are asking for nothing unreasonable, a friend is often won for pharmacy that is valuable beyond belief when the reputation of a member hangs on solely the probability of facts difficult to prove.

Pharmacy has these friends in Washington and by fair dealing we will keep them.

In these interviews there is no place for threats of any kind, even the possibility of intimidation by suggesting the using of Congressional influence cannot be properly resorted to.

On the other hand, a firm stand on the fundamental principles of pharmacy must always be taken. The government officials must know the numbers and the resources of those in pharmacy. Your representatives, whoever they are, must know the power and strength of their organization and unhesitatingly let the facts be known. Respect for organization must be won for an association, before that association's voice will be listened to and its strength valued.

A governmental official, even in a minor office, feels his power and often he respects only organized force. I am willing to say that the average member hardly realizes the extent of respect given in Washington to National associations, and I want to urge upon you all the importance of keeping up the membership and forces of organizations. It is not by any means a wrong use of power, but in

competition with government bureaucracy must be strong to hold its own.

And here comes one of the reasons why the new Pharmacy Headquarters Building in Washington will be morally one of untold benefits to the profession.

THE AMERICAN INSTITUTE OF PHARMACY.

There is a great deal to be said about the American Institute of Pharmacy, which is the official title of the lovely, marble palace which in the very near future will house the office staff of the AMERICAN PHARMACEUTICAL ASSOCIATION.

It is ideally located in Washington on which is fated to become the best known street in the world; for when the programmed, expensive, grand and elaborate buildings that are at present being rapidly completed are finished on Constitution Avenue, no street elsewhere can compare with it, not in any city nor in any capital. If one were given a half a million dollars to-day he could not go out and buy a site equal to the one on which the monument to Pharmacy is located.

For the benefit of those who have not the privilege of being acquainted with the City of Washington, let me pause and explain that originally the avenues were arranged to radiate from centers. One was from the Capitol, another important one from the White House. Time has made many changes in the city's plannings and street traffic so that now the pivoting points are anything but convenient. Therefore, Constitution Avenue was selected as a solution. It has been developed as a wide straight thoroughfare, with a continuous row of new government buildings facing upon it. Our building has been strictly supervised by government agents, although privately owned. Last of these in point of position on Constitution Avenue is our own new marble palace, however its prominence is made more eminent by its very position, which is not the jumping off place, for rather it is at the turning place of travel, which leads to the nucleus of the whole designing and to the grandest of America's architectural achievements, the Lincoln Memorial.

From the steps of the building, as from the corner of a square one may look in two directions, at right angles, one to the other and see first the Lincoln Memorial in front, and then to one side along Constitution Avenue the Hall of Science Building and the massive governmental structures, while in the other direction, a stone's throw away runs the historic Potomac River. Where else could be found a more fitting place for our home. Upon these same steps will tred the feet of our pharmaceutical nation and the wise of our profession for many years to come.

In other parts of the program will be more detail descriptions of this masterpiece, nevertheless I cannot pass it without giving praise to some of those members of the ASSOCIATION who deserve our deepest gratitude for untiring work, as do Dr. H. A. B. Dunning, Dr. Samuel Hilton and Dr. E. F. Kelly. Almost unsurmountable obstacles have had to be overcome one by one.

I had the honor to be one of the speakers at the simple but appropriate ceremony on July 1, 1932, of the Ground Breaking Ceremony. Like several other presidents ahead of me, I had held hopes of dedicating the finished building to the glorious profession of pharmacy but that was not to be, as those guiding the destiny of this most important work have made haste but slowly. However, I plan to be present next year when it assuredly will be finished; for it is now fast reaching that state, and I am herewith inviting all of you to be there and to bring those with you who have the love of pharmacy warm in their hearts. It is not

too late for each of you to personally have a hand in furthering the project and to feel a part of it. I urge you to do your *utmost.*

THE CENTURY OF PROGRESS.

Those of you who visit the Century of Progress will find in the Science Building in the Pharmacy booth on the first floor a miniature model of this future home of the AMERICAN PHARMACEUTICAL ASSOCIATION. In that booth you will find many things that show the progress that pharmacy has made in the last 100 years and you will find there Dr. H. C. Christensen, a recent past-president of this ASSOCIATION. He has assembled the Professional Exhibit for Pharmacy and has given time, work and money to furthering it. It is unfortunate that more money is needed to finance the actual care of it until the close of the Fair, and I am asking that every one of you send a donation to Mr. Julius Riemenschneider at 2500 Broadway, Chicago, Illinois. Send at least $5.00—make it $500.00 if you can, but send something.

PHARMACY WEEK.

Pharmacy Week is a subject that deserves special consideration here in convention, and in the drug stores of our members, and the pharmacy colleges by the students, and in hospitals and wherever the art is practiced.

A good many of our pharmacists are taking Pharmacy Week for granted, or are leaving it to be taken care of by committee work, and are not backing it as a live opportunity to advance the better part of our industry.

The late Dr. Robert J. Ruth started a new epoch in Pharmaceutical History, and Dr. Anton Hogstead is ably carrying the work on, however, Pharmacy Week must have more universal support.

I could point my finger to dozens of drug store windows which during Pharmacy Week were decorated with cigarette cartons. Is there so much glory in smokes and so much profit in them that true pharmacy and valuable drugs are forgotten by druggists? It cheapens any drug store to utilize its windows for such displays, but more especially is it reprehensible during Pharmacy Week. Dr. Ruth saw with distress the cheapening of our window space and his endeavor was to bring up before the public a true picture of the advancement of the arts of pharmacy much as the Century of Progress Fair is doing in numerous ways, and so to advance the spirit of the attempt to better pharmacy I hereby appoint every pharmacist as a member of an auxiliary committee to help out in Pharmacy Week the Centralized Committee, and I ask President-Elect, Dr. Robert L. Swain, to reappoint these helpers.

With your permission I shall announce a name that I have coined for those drug stores in which there is no Pharmacy Week window from October 10th to 17th. They are "wazernots" and we of the profession are not proud of them.

UNIFICATION OF THE NATIONAL ASSOCIATIONS.

Associated as I am at Washington with many representatives of organizations, I have been repeatedly asked why druggists have two national associations, the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists.

You perhaps know the answer, why there are two organizations but still that does not prevent the query voicing a live subject. The subject of the amalgamation of the two organizations, with preferably a central office in Washington deserves careful consideration. Not long ago one president of a State Association made the subject an issue in his presidential address. He argued that education, legislation and professional and commercial pharmacy might well be welded into one organization.

There are many members in both organizations who would favor a unification of the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists, their arguments are for more reasons than just for the saving of dollars and cents. I feel it incumbent upon me to report this very plausible union, as it is reiterated in almost every governmental department that I visit. For my double position has taken me into all of these departments at some time as a representative of first one organization and then the other.

I have always looked at the two national organizations as though they were chums who were out to do a big needed task. Many times their paths have crossed though scarcely ever have they duplicated work and at all times where it has been advantageous for a common interest they have joined hands and forces and have battled a common enemy. It is to be hoped that no false love will ever take one from the other or that no siren will, by the magic of golden coin, lure either of them into a state of discord and trouble, nor spoil the harmony now existing between the two.

If a time ever comes, be it to-day, or next year or in the distant future, that the now separate organizations join and travel forward as one, I shall wish them well. Until that time arrives I trust that neither will leave the path of service and that they will each become strong mutually and fully understand each other.

PHARMACY AND DRUG STORE.

The Drug industry is undoubtedly slated to accept many changes in the near future.

I believe that one of the most constructive steps in the furtherance of establishing the exact status of a drug store will arrive with a new definition of the words *drug store* and *pharmacy*.

With that end in view I offer as a constructive suggestion two definitions, which of course to be legal in the forty-eight states would have to be enacted into law in each of them.

A *Drug Store* is to be an establishment wherein less than fifty per cent of the stock, or in which the sales of less than fifty per cent of the items are public health service items. In such a *drug store* prescriptions will be neither received nor dispensed, although it shall be at all times under the direct supervision of a fully registered pharmacist. Only package medicines may be sold in such a drug store.

A *Pharmacy* is to be a professional establishment wherein over fifty per cent of the items in stock, and in which over fifty per cent of the sales made are of public health service items. A pharmacy shall be at all times under the direct supervision of a fully registered pharmacist, and in it only pharmacists shall have the right to compound and dispense prescriptions and medicines.

At the same time of designating drug stores from pharmacies or shortly after-

ward it will be possible to take one step further and say that *pharmacies* shall be *owned* ONLY by fully registered graduated pharmacists.

This would supply an honest basis for a Pharmacy Ownership Law, and I dare to tell you, after years of study given to the subject, both from a legal and pharmaceutical viewpoint, that something of this kind will be the only basis upon which we can have our nation recognize the pharmacy ownership principle.

There are druggists who, in their stores, fill on an average only one prescription a day. They may put up a fight against such regulating, as a matter of fact, they are using the professional part of their stores, because of its very respectability, to encompass an unlimited field, which field should be narrowed down to stricter limits.

I have only to call to your attention the fact that the word *pharmacy* has never been applied promiscuously as the word drug store has, and that those merchandising establishments which have commercialized the profession, and which have in some instances gone as far as they could to wreck in the eyes of the world, and of every one who reads their advertisements, or sees their window displays, the high standing of the drug store, have only used and abused the word drug store. They do not *claim* to be a pharmacy. It is time that the profession takes cognizance of the aptness of the two terms.

I suggest that it is time that we in the profession of pharmacy let those who have cheapened and abused the name drug store take it. Let us reserve for Pharmacy a name that means skill, art, science, health, service, education and professionalism.

When, by law and regulation a strictly new meaning is put upon the word *pharmacy*, then and then only will such establishments measure up to the high standards of professionalism that are enjoyed by doctors and lawyers. Then will we have something for our college of pharmacy graduates to strive for.

PHARMACY AND THE NRA CODE.

On July 27, 1933, the President of the United States, Franklin Delano Roosevelt, wrote into his Recovery Blanket Code in Section 4 of the National Recovery Act that the Labor laws did not apply "to registered pharmacists or other professional persons employed in this profession."

History was very definitely made in that sentence.

Are we going to entrench this position of the profession of pharmacy so that it can never be torn down? Are we not, as pharmacists, going to live and serve our communities as professionals?

The AMERICAN PHARMACEUTICAL ASSOCIATION has for eighty-one years supported the profession of pharmacy and it still will continue to do so.

As modestly as I may, I shall tell you that I presented the cause of pharmacists, and that I asked that they be exempted from the so-called Blanket Code if and when it should be issued. Although I was discussing hours and wages I was acting at that time in my capacity as Counsel for the National Association of Retail Druggists, nevertheless, I was President of the AMERICAN PHARMACEUTICAL ASSOCIATION, and most vitally interested in the ethical and professional side. I am more than thankful that I had the opportunity to carry on the work of the worthy presidents who have gone before me. I know of no act in my pharmaceutical career that gives me greater satisfaction.

Because pharmacists sell merchandise, other than health items does not in any way prevent them from remaining or being still professional. It is rather accredited to their ability or education that often they are able to carry on the two lines of selling at the same time, provided, that they are practicing the profession of pharmacy as defined by the laws of the several states.

It is not unusual for strangers in towns and cities to go first to drug stores for articles. There is no hesitancy in entering any drug store, inasmuch as they are always classed as respectable establishments. To this extent the title Drug Store on a sign is an asset.

LIQUOR PRESCRIPTIONS.

I, as your President, backed by the Council offer no apology for the stand taken by the AMERICAN PHARMACEUTICAL ASSOCIATION that beer has no place in a drug store.

It is not a question of morality, nor of personal privilege but that the past history of beer or the sale of it at retail is not one that fits in with the dignified practice of pharmacy.

If a saloon was to have put in a drug department we would be more than annoyed; then why should a drug store put in a saloon.

Respectfully I say beer is cheap, and that we are fast approaching a time when the drug store will lose its respect in the community and be judged by its cheapest product. Up to the present day the drug store has been judged on the merits of its most precious privilege—that of filling prescriptions and handling wares for the sick and injured.

If the privilege of filling of prescriptions is in any way taken from pharmacy little will be left to us. The licenses of pharmacists makes the privilege of filling prescriptions theirs and theirs alone.

Recently there have been repeated efforts made to have certain prescriptions for liquor filled at wineries and bonded warehouses or from stocks of liquors kept in other places than in drug stores.

Now it must be remembered that druggists did not ask for the privilege of filling liquor prescriptions, it was thrust upon them by the Administration, and the Prohibition Act, and its Enforcement, and now, after we have stood the abuse and ridicule of it, commercially minded interests are trying to switch it. As long as liquor is dispensed as medicine by physicians for the alleviation of pain and disease, the druggist should demand that they alone dispense it. When liquor is sold without a prescription then and not before will there be any right to place it elsewhere than in a drug store.

Pharmacists, be on your guard. See to it that the word prescription is not made a byword and in any way synonymous with a case of liquor, the purchasing of which is made by but forwarded from some warehouse to the home of a consumer.

Recently an effort was made to have the Attorney General of the United States modify his decisions so that a wine prescription could be filled at wineries and bonded warehouses if a registered pharmacist was employed there. A combined resistance was made by all officers of the AMERICAN PHARMACEUTICAL ASSOCIATION and by the National Association of Retail Druggists, and by many State

Pharmaceutical Associations, and a vigorous protest was registered against prescriptions being filled outside of the premises of a bonafide drug store.

I am sorry to include so much concerning liquor in my address, but it is a force to be reckoned with at this time, and needs the very prominence that I am giving it.

This month a plan was brought to my attention which proposes that drug stores have a coöperative liquor store house and that the retail druggist's permit be amended to include the address of the warehouse in it. Then when a prescription is to be filled for a *case* of wine or liquor, the pharmacist will phone to the coöperative liquor warehouse and have the liquor delivered to the consumer. This is still a danger—a danger even if a revised plan is substituted, whereby the liquor would be sent *via* the drug store to the consumer.

NATIONAL FORMULARY AND UNITED STATES PHARMACOPŒIA.

In the pharmaceutical world the five most important letters in the alphabet are National Formulary and United States Pharmacopœia. They stand as land marks and as authority in our professional world.

Even though druggists have moved Salt-mouth and Tincture bottles from the front of their drug store to the back room, yet some cry their eyes out when a formula passes from the United States Pharmacopœia into the National Formulary. Nevertheless, it is in the scientific and pharmaceutical path of progress for the United States Pharmacopœia to become more and more a book of simples, and to define drugs and chemicals, and for the National Formulary to be a book of formulas.

It is the old graduates who suffer when a beloved formula is transferred. They love the old remedies, mixtures and concoctions, the very names of which are not even whispered to the on-coming generation of physicians.

There is a great justification in each revised form that the United States Pharmacopœia passes through. As always it is being compiled by the combined efforts of the government, medical scientists and pharmacists, all skilled in standardizing our newer medicines, and preparing them from crude drugs and chemicals.

It is well that the formulas for the centipede-like chemicals are passed to the National Formulary here to be revised by our own master pharmacist.

Those of you who are afraid that prescriptions will no longer be written for more than one ingredient have little to worry over, if prescriptions are written and pharmacy kept in its own channels.

In connection with the United States Pharmacopœia and National Formulary, I want to ask the deans of Pharmacy Colleges to give me undivided attention.

It is of utmost importance that every student know the National Formulary thoroughly. Each must know the formulas in it, and be able to bring them to the attention of the physicians who most frequently send prescriptions to a drug store in which he is employed. And do not let us cloud the art of the pharmacists, nor spoil the picture, by talking about cheapness or price.

Every student should know that the National Formulary is controlled by *pharmacists* and that it is made to serve physicians in the practice of medicine.

CODE OF RETAIL DRUGGISTS UNDER THE NATIONAL RECOVERY ACT.

Now rather far down in this address because in point of chronology it is so recent, comes my report of the happenings of the Code of Retail Druggists under the National Recovery Act, and of the position that the AMERICAN PHARMACEUTICAL ASSOCIATION has taken in this most far-reaching and unprecedented business upheaval. It is old news to say that the President of the United States dictated that each Industry should make a Code, and later declared that if an Industry did not respond and make a code, one would be made for it.

Pharmacy, as a two-sided industry, has professional and commercial interests to look after. Indeed I must say that these are very much intertwined, and therefore a code satisfactory to every one presents a very complex situation. Modestly I say that it is providential that I, your President, am located in the Nation's Capital, and fortunate that the office of the Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION is located in nearby Baltimore, and more than opportune that my successor, President-Elect, Robert L. Swain, is so close in Maryland. It is impossible for me to put into this address but few of the multiplicities of complications which have confronted Retail Druggists in preparing a code.

To sum them up briefly will be sufficient, for I fancy that before I shall read this address most of the difficulties will be surmounted and the results will be quite universally known. So far, and as a consequence of the combined efforts of druggists, in the furthering of their ever-ready health service to the Public, they have been successful in keeping professional pharmacy and pharmacists excluded from the Commercial Codes. While on the other hand the strictly commercial side of pharmacy has been incorporated in a code for the consideration of the President of the United States and his authorized agents in the endeavor to reëstablish prosperity.

It is not likely that we will get all that we desire, nor that business conditions will seem ideal under it, but I do not hesitate to assume that very soon druggists will be able to adjust themselves to new conditions, whatever they turn out to be.

Strangely enough the Retail Druggists' Code has been framed to care for four classes of workers in drug stores.

(1) The registered professional druggists who are excluded from it.
(2) Those working in drug stores and handling needed health service for the public over long periods of daily servitude.
(3) Delivery boys, engaged in delivering medicine.
(4) Those who must accept the same hours as workers under other codes in industries which parallel them.

It is not possible to give at this time the ultimate hours and wages and conditions which will be allotted to each. When, during this code making, the AMERICAN PHARMACEUTICAL ASSOCIATION was called upon to help the National Association of Retail Druggists in solving code problems, it responded.

At no time has the AMERICAN PHARMACEUTICAL ASSOCIATION endeavored to usurp the field of the National Association of Retail Druggists in drafting the code. Opinions by officers of the AMERICAN PHARMACEUTICAL ASSOCIATION were freely given wherever it was thought they would be helpful. Your ASSOCIATION went

that far and no further. What the future of Pharmacy will be under the final code approved by the Administration of the National Recovery Act is difficult to prophesy.

As I said earlier in my address, it is fortunate your new home will be in Washington and that your next President lives nearby.

The professional side of pharmacy under any code will be looked out for at all times by the AMERICAN PHARMACEUTICAL ASSOCIATION. The National Association of Retail Druggists in attending to the adjustment code will be supported by the AMERICAN PHARMACEUTICAL ASSOCIATION when it needs help on any commercial or administrative problems.

So that there can be not the least possible doubt about my position, my policies and my actions, I want to distinctly state that I have acted in three different capacities during these times of strife. Sometimes it was as the President of the AMERICAN PHARMACEUTICAL ASSOCIATION, again it was as the attorney-counsel for the National Association of Retail Druggists and at other times I was just W. Bruce Philip, proprietor and part owner of a retail drug store, Philip & Philip, in Oakland, California.

I have found it extremely difficult to divorce the person from the offices that I hold, in the minds of some prejudiced individuals, nevertheless I have expressed my honest opinion at all times, and I, for one have answered all questions that have been asked me, in my respective capacities. I have not joined in any one of my three capacities, any drug organization wherein I would have to be bound with the by-laws which say, "every member must obey all rules made by a board of directors."

I have been criticized because I have not joined one of these, but I hold fast to the American principle that I have a right to stand on my own honest convictions, and I still consider it best to support the two great organizations which separately and together have long labored for the good of Retail Druggists. Whenever needed, the AMERICAN PHARMACEUTICAL ASSOCIATION has rallied to the support of the National Association of Retail Druggists and repeated by the National Association of Retail Druggists has espoused the ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION. It is fitting to say that with due regard for all this backing, I again reaffirm the stand that I took three years ago and again I say, "the Retail Druggist must look out for himself."

SALES IN A DRUG STORE.

It is a new idea to me that restrictions on the use of alcohol can be blamed for what a *C. & D.* correspondent describes as the retrogressive nature of pharmacy and its degradation to mere shopkeeping, and I am disposed to think that he attaches an exaggerated importance to views expressed by earlier correspondents, who appear to me to be unduly pessimistic about the future of general pharmacy. The practice of pharmacy is not a trade, though associated in shops with the trading operations included in the business of a chemist and druggist. As I conceive of the occupation which is properly described as pharmacy, it includes no sales or trading operations, so that it cannot possibly degenerate into mere shopkeeping or the sale of goods of one kind or another. I have practised pharmacy and carried on business as a chemist and druggist in the same shop; but it never occurred to me when sales were brisk that I was being degraded as a pharmacist, or that there was anything retrogressive about what I was doing when handing goods over the counter and receiving payment.—Xrayser in *Chemist and Druggist*, September 9, 1933.

ADDRESS OF THE CHAIRMAN OF THE HOUSE OF DELEGATES.

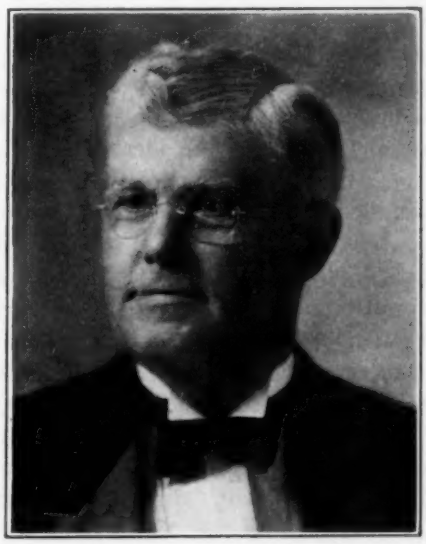
BY J. W. SLOCUM.

To the Members of the House of Delegates of the American Pharmaceutical Association:

To be elected Chairman of the House of Delegates is a distinct honor which I deeply appreciate. It came wholly as a surprise and unsolicited at the Toronto meeting last year. As your Chairman, I shall endeavor to decide impartially the will of the House.

Perhaps never in pharmaceutical history have there been so many intricate problems facing the members of our profession as exist to-day.

A speaker of 50 years ago might, honestly, have made a similar statement but that does not indicate it would not be more true several decades later. The years have brought new problems never even dreamed of a half century ago. The coined phrase "Profitless Prosperity" was not applicable to that day and age; it describes a frenzied, and almost fanatical theory of intensive merchandising which should have had little place in the practice of a profession such as ours. The race to make volume the greatest objective has caused men to lose sight of the true values, originally intended to be achieved. The founders of our profession fondly hoped that pharmaceutical service would always be considered of paramount importance, instead of being represented in the development of gigantic merchandising emporiums such as we have to-day.



J. W. SLOCUM.

In spite of such developments, we are glad there are still men and women who honor the profession of their adoption and still adhere to the conviction that humanity will continue to appreciate the best of pharmaceutical service. For more than 80 years the AMERICAN PHARMACEUTICAL ASSOCIATION has promoted the highest principles of professional pharmacy and despite the tendency of the times, has engendered within its members a love and devotion that will never die. Much sacrifice has been necessary to bring this organization to where it stands to-day and those of us who are here, should not be slow to recognize the debt of gratitude we owe to those who made it possible.

As the years go by we become more appreciative of real values and we hope that, within this organization, our appreciation may be demonstrated by becoming more familiar with the precepts and principles for which it stands.

It frequently happens in large organizations that many of their members do not fully understand the functions of certain sections with which they should be familiar. That is doubtless true of this the parent organization of American Pharmacy.

With this idea in mind it occurred to me that a brief review of certain phases of our organization might be worth while, and especially that pertaining to the branch known as the House of Delegates. I take it that almost every branch of pharmacy in the United States is represented at this meeting. If they are not, we feel certain that they should be.

This should be a sort of home-coming for all members of the family. The leading officials of State associations are neglecting an opportunity if they do not attend the annual sessions of this great organization. I have been so impressed with the importance of this suggestion that last spring a letter was addressed to all State association presidents and secretaries suggesting that if Executive Committees had their attention directed to this matter and their coöperation solicited, something definite might be accomplished. Some State officials replied that they were already sending their leading officials to the AMERICAN PHARMACEUTICAL ASSOCIATION conventions, implying that they had long since recognized the importance of such a move. We are certainly glad that all associations were not delinquent in this matter, but hope the letter did reach certain states which gave some thought to the idea.

Attention was called to the fact that an ideal representative body could be assembled, if all State associations would act upon the suggestion.

To the president and secretary of State associations, their members look for a progressive program, and conventions such as this are intended to provide inspiration and stimulate creative effort. The House of Delegates is the legislative branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. Among its many duties, it receives the reports of standing committees, elects and nominates certain officers, selects the place of meeting and prepares the resolutions for adoption.

It is composed of accredited delegates from State associations, the Conference of Pharmaceutical Association' Secretaries, the Conference of Pharmaceutical Law Enforcement Officials, the Plant Science Seminar, the National Association of Retail Druggists, National Wholesale Druggists' Association, American Association of Colleges of Pharmacy, National Association Boards of Pharmacy, American Drug Manufacturers' Association, the Proprietary Association, American Pharmaceutical Manufacturers' Association and Federal Wholesale Druggists' Association.

You will observe therefore that the By-Laws have provided for a thoroughly representative body including all branches of the drug industry.

It is obvious, then, that the State associations having a majority of the delegates of this body, if they have availed themselves of that privilege, are in a position of influence which should be used for strengthening their organizations. And, if strong State associations are built up, the result will be reflected in a stronger parent association.

Constant contact with such institutions as this can only result in greater enthusiasm for the betterment of pharmacy and that, primarily, is the only excuse for its existence.

Upon the Chairman of the House of Delegates devolves the duty of appointing a nomination committee of nine members whose duty it shall be to nominate the candidates for the offices of President, First and Second Vice-President, and the candidates for membership in the Council. This Committee shall also nominate the Chairman and the Vice-Chairman of the House of Delegates.

At the final session of this body the Chairman shall appoint a committee of five members on Place of Meeting and this committee shall report at the second session of the next annual convention. Among the most important committees of such an organization as this, is the Resolutions Committee, and upon the House of Delegates is placed the responsibility of its appointment. To this committee the address of the president of the ASSOCIATION is referred.

Even a proposed amendment to the By-Laws must be submitted in writing at one session of the House of Delegates and such resolution may be acted upon at the next session.

Your Chairman calls your attention to these provisions of the By-Laws, not because of anything new concerning them, but rather to place the proper emphasis upon the important responsibilities which are yours as delegates to this most honorable body.

One of my predecessors took occasion, a few years ago, to say that "The House of Delegates is the foremost body that can at this time be brought together representing pharmacy in all of its many, many phases."

Now, all this would appear to be more or less of a eulogy but to say the least, it is not a eulogy over the remains of the departed. The body is still intact and functioning in the best of health. Rather, we have tried to make you proud of the institution of which you are members. When the realization of our importance is brought home to us, our loyalty is assured. If we make use of the organizational facilities we now have, we shall make definite progress.

In recent months, much has been said and done to detract from serious thought along the lines of professional service. The National Industrial Recovery Act and the adoption of codes of fair competition have occupied our almost undivided attention.

Many stores are greatly concerned as to whether they will be able to survive or not, and it is to be hoped that the recovery steps taken will prove to be a panacea for their ills. Stabilization and maintenance of resale prices are possible attainments of the recovery act and this to my mind is the most encouraging feature possible of achievement.

The Century of Progress has given our profession an unusual opportunity to impress the world with its real importance. Those who assumed charge of the Century of Progress Exhibit have very successfully depicted the growth and development of Pharmaceutical Education and legislation for the past one hundred years. It is worthy of note, that the height of interest to the public is the semicircular prescription compounding case, where pharmacists are daily performing many duties of their profession in full view of the public.

It is more than passing strange that in a gigantic exposition, where there is so much to attract the attention, that the simple compounding of medicines should receive more than a hurried glance.

The display of the famous Ebers Papyrus, the earliest known book of remedies, in contrast with the United States Pharmacopœia and National Formulary of the present day is a very unique educational exhibit. The romantic story of drug discovery and development bears an interest to the laymen as well as to the chemist, the pharmacist and the medical practitioner.

The culmination of the hopes and ambitions of many, a home for American

Pharmacy, is about to be realized in the completion of the Pharmacy Building in Washington. This is an outstanding achievement in the annals of pharmaceutical history and will, doubtless, impress the people of the world as no other single event has ever done. And so our profession has kept in step with the progress of the century just passed. We are justly proud of its accomplishments.

In the past few years we have been passing through trying times. It is difficult under circumstances such as these to undertake and promote new projects. But now that the tide is turning, it is highly probable that new projects will receive more encouragement.

From an economic standpoint, many things have been discouraging from the retailers' point of view. Much has been said about the dispensing of medicines by practicing physicians, and some have indicated that this condition was improving, but when you survey the situation in the various districts of most any state, you will still find this most serious complaint among retail druggists.

Our schools of medicine are doing little to alleviate this condition. Not long since I had a conversation with a school official of a large university, and he told of an interview with a medical student. The student indicated that prescription writing was taught only half-heartedly and said that a large majority of a graduating class made the assertion that they intended to dispense their own medicines. What other result could be expected when they were not encouraged to write prescriptions?

It occurs to me that here is a field for fruitful study and investigation by the AMERICAN PHARMACEUTICAL ASSOCIATION, which might prove of great value to the retail drug industry.

There may never come a time when all the evils to which we are heir will be corrected, but a program of constructive effort along these lines would be welcomed throughout the entire country.

There never was a time when it was so necessary to present a solid front and march in unison as it is to-day. Petty jealousies should be eliminated and sectional prejudices forgotten. If we are to win in the struggle to bring pharmacy back to a firm foundation, it will take all the unified forces and dominant courage we are able to muster. But with the best brains of the industry working together in a common cause we shall prevail.

"The Gravimetric and Volumetric Determination of Brucine and Strychnine as Dichromate," by I. M. Kolthoff.[1]—Brucine salts yield a precipitate with potassium dichromate which, after drying over deliquescent sodium bromide, has the composition $(C_{23}H_{26}N_2O_4)_2.H_2Cr_2O_7.5H_2O$. Strychnine dichromate prepared under the same conditions has the composition $(C_{21}H_{22}N_2O_2)_2.H_2C_{22}O_7.H_2O$. Gravimetric and volumetric procedures are described for the quantitative determination of brucine and strychnine as dichromates.

"The Determination of Strychnine and Brucine as Hydroferrocyanides and Their Separation by Means of Ferrocyanide," by I. M. Kolthoff.—The sensitivity of the precipitation of strychnine and brucine in hydrochloric acid medium with hydroferrocyanide has been determined.

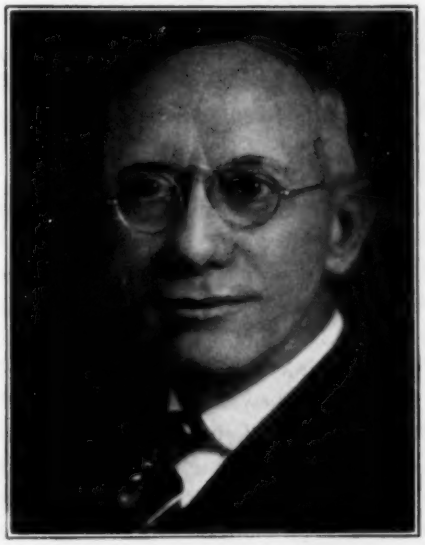
Strychnine can be determined with great accuracy by precipitation as hydroferrocyanide. The precipitate is weighed in the air in dry form. The method yields quantitative results even at great dilution. The determination of brucine is less accurate owing to the greater solubility of its hydroferrocyanide. A simple method is described for the quantitative determination of strychnine in the presence of brucine. It is based on the fact that the hydroferrocyanide of strychnine is less soluble and is formed more rapidly than that of brucine.—[1] Scientific Section, A. PH. A.

ADDRESS OF THE PRESIDENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

BY CHARLES H. STOCKING.

Under Canadian skies, at the last Annual Meeting of this Association, and, incidentally, in the year which marked the One Hundredth Anniversary of the birth of its first president, the American Association of Colleges of Pharmacy very graciously bestowed upon the speaker the highest honor at its command.

The privilege of serving as your president has been a most pleasant and worthwhile task and one that has contributed much of value to my fund of information concerning the specific functions of this organization. For your confidence in me, and for your excellent coöperative assistance during the year, I wish to express to you my sincere thanks and deep appreciation. If in any measure of your estimate of my ability I have served the Association acceptably as its executive officer, I am glad.



CHARLES H. STOCKING.

The year 1932–1933 is historical for pharmaceutical education in America because it is the doorway through which all member colleges of the Association have entered into the realm of the minimum four-year curriculum. For a number of institutions, the four-year requirement for graduation is not an experiment of recent origin. Such a practice, either as the sole method open to matriculants, or as an optional plan, has been in effect in several of the member colleges for a number of years. Other colleges have made this adjustment only with the beginning of the collegiate year just closed. Probably, in certain respects, no less auspicious time could have been selected. College and university budgets have been drastically reduced, making it difficult in many instances to expand the faculties and to purchase needed equipment. Many young men and women have been hampered and even blocked in their attempts to secure an education in pharmacy. In spite of the great increase in the number of graduates from the high schools of the nation, college attendance has declined in many localities, not because of the lack of thirst for knowledge on the part of the youth of the land, but because brains cannot be fed unless the body can be nourished, and the body cannot be nourished on an income reduced to the vanishing point. However, in the face of these handicaps, namely, reduced collegiate budgets and reduced student budgets, the first year of the Association under the minimum four-year curriculum requirement has drawn to a successful close. Some of the member colleges have even reported an increase in attendance. The number that have been operating under discouraging conditions has been exceedingly small. Actually, very few of the colleges have found the beginning of the road really rugged under the "new deal," and it is to be expected

that the way will be smoothed out for them as time progresses. Therefore, it is worthy of note that such remarkable progress has been made in pharmaceutical education in America in the past decade in building the foundation for the standard college curriculum in pharmacy, and in inaugurating that curriculum into actuality in a year filled with difficulties financial in character for faculties and students alike.

With Dean Leigh, my immediate predecessor in office, I agree that considerable time should elapse before we vote to extend the graduation requirement beyond the four-year limit under which we are now operating. We are all grateful, I am sure, for the advance that has been made and it is evident that we must remain steadfast in the accomplishments of the past years, "holding fast that which is good." No attempt of a retroactive character can be tolerated. On the other hand, in the words of our immediate past-president, "Let us first obtain a firm footing on the prescribed four-year course before we proceed to ascend; which on being interpreted into plain language means that we should first translate our new requirements from paper to almost perfect performance before discussing seriously the question of the inauguration of a two- or three-year pre-pharmacy course; or of recommending that state boards demand that candidates for registration hold at least the Master's degree before being admitted to examination." This, I think all of us will agree, is sound advice. The giraffe *having* acquired its long neck by reaching up for its pabulum has perhaps reached high enough for the present and should proceed to digest and elaborate the pabulum of which it has just come into possession. Let the content of the four-year curriculum and the method of its presentation to students of pharmacy be studied very carefully. Let us even teach English in the *fourth* year instead of in the first year if that would seem to be the thing to do. Let us look to the true cultural training of the future pharmacists without encroaching upon the fundamental fields of pharmacy, chemistry, pharmacognosy, pharmacology and other scientific subjects by so doing. Let us increase our library facilities and teach our students the true worth of books of reference and let us teach them how best to use these books in order to make of them real tools of service. Let us emphasize more than ever before, the necessity of a close acquaintance with the current scientific literature of the time. Let us as teachers instil into the minds of our students a love and respect, not alone for the ancient and honorable profession of pharmacy, but also for a modernized pharmacy, in order that they may revere and learn to practice its Code of Ethics and to stand at all times as proud representatives of the pharmaceutical branch of that large and vastly important group of public servants known popularly as the health professions.

Standards we may have, but standards without a spirit are but dumb creatures indeed. Too long has pharmacy occupied a subservient place in the minds of its devotees. Too long has it carried on its duties to the public in a mechanical, faithless sort of way. Only through the inspiration emanating from the educational group, with the manifold opportunities at its command, can the next generation of pharmacists enter into possession of the proper professional esprit. As members of the various faculties constituting this Association I believe it is our solemn duty to examine ourselves and to so catch the gleam of the ideal toward which we would direct our students that we lose sight for the time being of so many of those things

that have occupied our discussions in recent years, and devote our undivided attention to means and methods of enriching the courses which we are now teaching, vitalizing these courses, not only with new facts where needed, but with facts so presented that they will draw from the students that quickened interest which prompts the thirst for a broader and deeper knowledge of the subject at hand.

It is told of the great Agassiz that he was presented one day with a check for $1000 and invited to use it to defray the expenses of a trip to Europe. The scholar replied that he was too busy to go to Europe; that the journey was too confined; and because he wished to travel over vaster regions, he proposed to spend the summer in his own back yard. That yard was scarcely more than a few rods square, but Agassiz traveled over it very carefully. In one corner of the yard he found a small stone that held the outline of a mollusk. Nearby was another pebble holding the impression of a broken fern, while other stones were found each of which held its own image and superscription. Three months from the time he started, the scientist reached the other end of his lot. He made a carefully prepared record of his observations and experiences and published them under the title, "The Journeys of a Zoölogist."

The moral of this tale is obvious. Each individual here and each organized unit—school, college, department—has a back yard that will stand examination. Out of the dust of the commonplace can come the knowledge of the centuries and prophesies for the future. Careful examination of internal conditions often reveals faults and imperfections that demand correction. If any faculty member is not living up to the standards that should be set to guide him in his work, he should be the first to discover the fact, and the first to bring into play the necessary corrective measures. If any college of Pharmacy is knowingly deviating from the qualifications established by this Association for membership therein, steps should be taken at once to bring into line every phase of its activities in order that no criticism can obtain either from within or without.

We are convening for this, the thirty-fourth annual meeting of the American Association of Colleges of Pharmacy, in the environs of a great university whose Course in Pharmacy is celebrating this year the Fiftieth Anniversary of its founding. To have survived a half century means little, but to have been known for that period of time as a leading institution of learning and promoter of scientific research is a notable achievement. The faculty here has given to the students who have come to them that vision of the true spirit of learning which is so essential to the art of becoming really educated. As the result of this vital, dynamic force activating the minds of the students in this historic institution, the status of pharmacy in Wisconsin and throughout the nation has been appreciably advanced. From the pharmaceutical research laboratories of this university have come scores of scientific publications to enrich the fund of knowledge concerning pharmacy in its many branches. Graduates from its halls have gone out to inspire countless others to a true appreciation of pharmacy as a life work.

To Dr. Frederick B. Power, who was the first Director and who for a period of nine years served on the pharmacy faculty of this university, and to Dr. Edward Kremers, his successor, who has devoted forty-one years of his life to teaching and research here, great credit is due. The record of achievement that has been established in teaching and in research in the Course in Pharmacy in the University of

Wisconsin is worthy of emulation by those colleges of pharmacy that have been less aggressive along similar lines.

I feel that it would be but a meager tribute on our part if we were to adopt at this convention a resolution extending to Doctor Kremers, the Director of the Course in Pharmacy of the University of Wisconsin, and to his staff, our heartiest congratulations on the remarkable record of the first half-century of the institution, and expressing our faith and confidence in the future developments of pharmaceutical education in Wisconsin as exemplified by the results of the last fifty years.

While the University of Wisconsin is commemorating the Fiftieth Anniversary of the teaching of pharmacy within its halls of learning, the nation is celebrating, in nearby Chicago, A Century of Progress. Among the exhibits that have been prepared to portray the vast changes that have been wrought by the hand of time, visitors to the Exposition are reminded that the last ten decades have brought evolutionary developments, scientific and commercial, to our own time-honored profession. Emphasis is placed upon the United States Pharmacopœia and its companion work, the National Formulary, and the part they play in providing the physician and the pharmacist with formulas and materials for combating disease and preventing its occurrence. Chemistry and its application to the various problems having to do with the health of the public is brought into the limelight. The spirit of science and of education is being immortalized in the minds of all who view the marvelous exhibits. He is daring, indeed, who would attempt to visualize a Century of Progress Exposition one hundred years hence. My only message in that regard is one of hope and admonition that we as progenitors of the pharmacy of the future may leave a heritage that will do credit to the enlightened vision that has been given to us. May this Association be the Arcturus that shall light the pathway of the colleges of pharmacy a century in the future!

That conditions within the Association are constantly passing through an evolutionary process tending toward improved standards is self-evident. A perusal of the catalogs of the member colleges shows an increasing number of the younger faculty members with graduate degrees. The subject of qualifications of faculty members has been discussed on numerous occasions before this body and I feel justified in saying that it is evident that candidates for teaching positions in colleges of pharmacy realize more than ever before the necessity of graduate work as a prerequisite to employment. Furthermore, there is a distinct movement on the part of faculty members to-day to expand their professional training by enrolling in the graduate schools of the various universities in this and other countries for the purpose of specialization along scientific lines. The urge that has been given to this movement in the past is without doubt bearing fruit.

Other evidences of improvement within the colleges are perceivable as one views conditions at the present time in many of the member colleges and compares them with conditions that existed a few years ago. Beginning with the year 1927–1928, the regular triennial visitation trips to member colleges have been made. In most instances I am sure that the institutions visited have been helped in one way or another. No soiled linen has been washed in public, and perhaps not enough laundering has yet been done, but I believe the ultimate results have been worth far more than the cost. One very excellent result has been the amalgamation of the colleges into a closer union through the interchange of ideas and

friendly criticisms between faculty members of the visited institutions and the visitor from another institution. I would urge that the visitation program be continued.

During the year just drawing to a close, the American Council on Pharmaceutical Education has been organized with three members from this Association, three from the AMERICAN PHARMACEUTICAL ASSOCIATION, three from the National Association of Boards of Pharmacy, and one, an advisory member, from the American Council on Education.

I have been informed by Dean DuMez, Secretary of the Council, that the work that has been done up to the present time has been of a preliminary nature in so far as the organization of the Council is concerned. Dr. Robertson, the representative of the American Council on Education, was not appointed to the Council on Pharmaceutical Education until early in the present calendar year. The formation of the group was, therefore, not complete until that time. It then developed that Dr. Robertson felt very strongly that it would be advisable to attempt to secure the coöperation of the colleges outside of the American Association of Colleges of Pharmacy before the work is actually started. Furthermore, it was agreed that the representative of the American Council on Education should make this attempt. These preliminary steps have required time, so much time in fact that the Council has not been able to begin the actual work of outlining its program previous to this meeting. Dr. Robertson expected to be present in Madison to address the Association but found it impossible to do so as he was compelled to go to Europe and will not return until some time in September.

The Fourth Edition of the Pharmaceutical Syllabus which has come from the press since our last meeting is a credit to the Committee which directed the work of preparing it, and especially to Dean J. G. Beard, the Chairman of the Committee. I feel that this Association as a contributing member of the joint Committee should express to Dean Beard its deep appreciation for the untiring effort which he put forth to bring to completion in such a satisfactory manner the work of preparing and publishing the Syllabus, *and I so recommend.*

Two states, namely, Georgia and Wyoming, have enacted laws during the past year raising their standards to college graduation as a prerequisite for registration in pharmacy. Attempts to secure prerequisite legislation in some of the other states were also made, but without success. I regret to report that in Michigan, my own native state, legislative efforts intended to demand in the near future college graduation as a qualification of all candidates for registration met with defeat in the Senate after receiving favorable consideration in the lower branch of the legislature. It is to be hoped that this condition will soon be corrected, not only in Michigan, but in the other states that are now operating on the lower requirement basis. The great states of Massachusetts and Tennessee, as well as several states in which no colleges of pharmacy exist, are operating without the educational requirement. Early in the present year a graduate of the College of Pharmacy of the University of Michigan wrote to Secretary C. C. Glover as follows:

"Will you please fill out the enclosed College Certificate Blank for the Illinois Board of Pharmacy and return same to me? I applied for registration here in Illinois by reciprocity on my Michigan Registered Pharmacist's License, but was refused because I wrote and passed the Michigan Board of Pharmacy Examination prior to graduation from the University."

These two sentences paint a picture which typifies the experiences of countless other candidates who attempt to reciprocate from states operating on the lower requirement basis for registration to those states which demand college graduation as a prerequisite. This young man graduated from the four-year curriculum of the College of Pharmacy of the University of Michigan in June 1927. A year or two previous to graduation he saw fit for one reason or another to write the Board Examination. He was successful. Seven or eight years later he found it necessary to become registered in Illinois, and because the Michigan law did not prohibit him from applying for the privilege of registration previous to graduation, he was rightfully denied the privilege of reciprocity.

Under date of July 24, 1933, the following letter was written to me by a practicing physician in California:

"I wish to call your attention to a great abuse on the pharmacy profession in California. For a number of years any person who had worked three years in some pharmacy and had memorized the answers to certain sets of questions as usually given at the Examination of the Board of Pharmacy of California was allowed to go before this Board, and, if able to answer 75% of the questions, was given a license to function as a druggist!!! Just imagine, allowing such ignorant persons to be given a license and with no training in a school of pharmacy!!! I have met a number of such unprepared 'druggists;' some of whom seem to be worthy of the designation 'moron.'

"The general public knows nothing about the humbug, and the 'druggist' (!!!) fills the prescriptions the best he can!!! I understand that the state of Arizona allows such, non-graduates, to attempt to 'pass' the Arizona Board Examination.

"Is there no way to prevent such untrained men from functioning as druggists, when we know that hundreds of well-trained graduates in pharmacy are walking the streets looking for positions? Here in Santa Rosa we are filled up with such non-graduates. Five minutes' conversation with any of them will convince you in regard to what to do with them. Please help to correct the abuse."

While his information isn't quite up-to-date in so far as the California requirements are concerned, his sentiments are rather forcibly expressed. The very fact that the educational requirements for registration in California and in some of the other states are low, introduces a problem of serious consequence to the colleges of pharmacy located in those states. In order to extend the benefits of reciprocity to all registrants, and to raise the status of the profession of pharmacy to a plane that shall remove it from the unfavorable criticism of the members of the medical profession, and to give every pharmacist in every state the high regard that he should hold for himself and for his fellow pharmacists, state boards of pharmacy and college of pharmacy authorities in all states that are not now requiring graduation as a prerequisite to registration must work together to bring about the necessary legislative changes at the earliest possible date.

I wonder how many of you have read the article in last month's *Outlook*, by Dr. Harold Rypins, Secretary of the New York State Board of Medical Examiners, under the caption, "Toward Professional Guilds." He says in part,

"The United States has more physicians per unit of population than any other country in the world. With a total of 156,440 licensed physicians at the present time, we have one for every 780 persons. England has one doctor per 1490 persons; France, one per 1690; Sweden, one per 2890. The Commission on Medical Education estimates 'that a reasonably complete medical care can be provided in the United States on the basis of one physician to about 1200 persons; that an adequate medical service for the country could probably be provided by about 120,000

active physicians.' According to these figures we have a surplus of approximately 36,000 physicians.

"'This town is damnably over-lawyered, what we need is fewer and better lawyers,' declares a *New York Times* editorial. The census of 1930 reports 160,600 lawyers in the United States, an increase in one decade of thirty-one per cent—almost double the rate at which population increased. One law school in a large eastern city, by dint of jamming crowds into a small building, made a fortune on a small investment. There were as many as 500 students in one room, and the course was aimed, not at a high-standard legal training, but straight at the bar examination.

"The over-production of architects is manifest in the report of the Architects' Emergency Committee of New York, in 1931, which states that of the 800 architectural draftsmen who were unemployed, 500 were destitute. There are 3358 architects registered in New York.

"We have approximately 100,000 pharmacists in the United States. On a population basis, they operate six times as many drug stores as are found necessary in Germany, which has well-organized apothecary shops.

"This year, there are 243,830 graduate registered nurses in the country. In some sections it is said that there are ten nurses for every job and a fearful struggle for existence is going on in this hopelessly over-crowded field.

"Concerning teachers, the Biennial Survey of Education reveals that more than 3000 graduates of New York City training schools were qualified for positions in 1930, whereas less than one-third of them could be actually placed on the eligible list. Throughout the nation there are approximately one million teachers. About 166,000 are needed annually to take the places of teachers leaving the profession. Yet, as long ago as 1928, there were 274,348 students in training. What is happening to the enormous surplus of trained teachers? Look behind the counters in the larger metropolitan department stores. It would be interesting to know what percentage of salesgirls in these stores are teachers awaiting appointment, and how many years they have been waiting.

"Of dentists, the nation has 67,000. In certain urban districts, there is one dentist to every 500 people.

"The effects of over-production in the professions, besides unemployment and excessive economic competition, are manifold. 'An over-supply of any branch of learning,' declares Dean Rogers of the University of Colorado College of Law, 'usually results in the development of price-cutting, irregular trade practices and a fringe of casualties, losses and waste at the unsuccessful margin. There will be the temptation to low ethical standards produced by desperation. The public in the end will suffer, as the individual does, from the existence of misfits, failures, wasted energies and frustrated efforts.' In the profession of medicine, over-crowding has increased fee-splitting, unnecessary services, padding of bills, illegal operations and the employment of 'runners.' The compensation rackets have developed to such an extent that physicians are reported to be giving half, and sometimes two-thirds, of their fees to get this business. Corrupt conditions such as these will not encourage students of superior ability and character to enter the profession. 'In law,' Philip J. Wickser, Secretary of the New York Board of Law Examiners, declares, 'there is a dim consciousness that the bar is surely, and not so slowly, being de-professionalized. For this there are many reasons, each of which is aggravated by the undeniable factor of volume.'

"These enormous surpluses make it obvious that admission to the profession must be restricted.

"Criticism of the 'aristocracy' or 'guild idea' in the profession is inevitable. Loudest will be the cry that a trust, or monopoly, may be created. As a matter of fact, the practice of medicine is already a monopoly in the sense that the source of supply of physicians is restricted to those institutions which are recognized by the state for the purposes of medical licensure. The intent of this monopoly is not to create benefits for the medical profession, but to protect the public. Moreover, the special position in society of the doctor, the lawyer, the nurse, the teacher, in itself makes the 'trust' inevitable.

"There is still the democratic fallacy to be disposed of. The irate father of an unsuccessful applicant to a medical school recently voiced the feeling of many in similar circumstances. 'Every American boy who wants to enter a profession,' he said, 'is entitled to have a try at it.' Should a monopoly, then, bar a large number of young men from their inalienable right to become physi-

cians, engineers or dentists? Would not many competent men be kept out of the professions? To this one may say that, taken by and large, the real danger is of loosing incompetent men upon the public by unrestricted training and licensure.

"It becomes clear that because of lack of planning and foresight we have trained professional men and women without any consideration of possible consumer requirements. Even where there has been some restriction through insistence upon high educational standards, no one appears seriously to have contemplated refusing permission to open new professional schools on the grounds that there was no need for them.

"Professions are just beginning to realize that it would be very desirable to train and license only as many architects, nurses, lawyers, teachers, physicians, pharmacists or engineers as the country can employ. As this idea gains wider acceptance it seems inevitable that an aristocracy of professional classes will arise. The selection of a limited number of candidates for each profession, will, for the most part, rest with the professional schools themselves, under the direction of the state licensing authorities. Both the public and the medical profession have already profited by partial restrictions in this field. Dentistry and law are passing through the stages of limitation by increased educational standards which medicine has inaugurated during the past twenty years. A much shorter period will elapse before engineering, architecture, nursing, teaching and the other professions take similar steps toward professional guilds.

"The effect will be revolutionary."

Are we in pharmacy moving toward the professional guild idea? Is this our aim and objective? If so, are we moving rapidly enough? Are we interested in mass production, or in quality within restricted numerical limits? The problem of supplying the demand for graduates without overstocking the market is not one for the colleges alone to solve, but is far more complicated. The coöperation of Boards of Pharmacy and trained pharmacists in every commonwealth must be solicited in order that a unity of effort may be put forth to bring into being the needed changes, legal and otherwise.

Boards of trustees and other bodies who have charge of the financial affairs of the various colleges of pharmacy must be appealed to in no uncertain terms in order that they may realize to the fullest extent the necessity of providing funds adequate to present-day needs. Further financial retrenchment cannot continue without hampering seriously the progress that is being made.

In the thirty-three years of its existence, this Association has had a record of achievement of which it can well be proud. In conjunction with its coöperating organization, the National Association of Boards of Pharmacy, by means of the joint sessions and the District Meetings, many important developments have been made for the benefit of the public and the profession itself. I predict that its future will reveal a record none the less glowing in its accomplishments.

"Tincture of Stramonium Seed Free from 'Plant Dirt,'" by Ralph Clark and Edward Kremers.[1]—Though richer in alkaloidal content than the leaf, stramonium seed has been replaced almost entirely by the leaf in the making of galenicals. This has been due, in large part, to the high percentage of fatty oil in the seed. True, the seed can be deprived of its fatty oil content before percolation with an alcoholic menstruum, but, even if this precaution be taken, the finished preparation will be highly colored because of the dark pigment in the seed coat. No doubt, there are other disturbing factors. Much, if not all of this "plant dirt," as Lloyd calls it, can be eliminated by mixing the ground seed with freshly slaked lime before extracting it with alcohol in the percolator. The pigment is altered so as to be rendered insoluble. What other changes take place has not yet been ascertained. For this first experiment a defatted seed has been employed.

[1] Abstract of a paper—Scientific Section, A. PH. A.

ADDRESS OF THE PRESIDENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.*

BY CLARE F. ALLAN.

Mr. Chairman, Members of the National Association of Boards of Pharmacy and Guests:

It is indeed an honor as well as a privilege to greet you to this, the thirtieth annual meeting of the Association.

We are very fortunate to be able to hold our meeting in the city of Madison, which for nearly a hundred years has been the center of educational as well as political activities in the state of Wisconsin. Madison, with its beautiful University and Capitol buildings surrounding the shores of its several lakes, gives to us an inspiration which cannot help but make this convention a success. Not only has the State of Wisconsin contributed greatly to the success of the country through its various industries and agricultural interests, but it has also contributed a number of recognized leaders in pharmacy. I am certain that we are going to gain a great deal of good from an educational standpoint as well as one of pleasure from this meeting.

CLARE F. ALLAN.

ASSOCIATION AFFAIRS.

In the discussion of the Association's affairs, I shall endeavor to be as brief as possible but at the same time give you a summary of the year's operations without going into any lengthy statistics. The detailed statements will, of course, be given in the Executive Committee report and those of the treasurer and the secretary. Nevertheless, I want the members of the Association to be conversant with some of the facts pertaining to the operation of the Association.

Our cash balance at the beginning of the year was eight thousand four hundred ninety-five dollars and seventy-eight cents ($8495.78) some of which was invested in government bonds. At the close of the fiscal year, five thousand five hundred seventy-five dollars and sixty-seven cents ($5575.67) or a decrease of two thousand nine hundred twenty dollars and eleven cents ($2920.11). The decrease in net worth was two thousand, seven hundred ninety-four dollars and fifty-six cents ($2794.56), not quite so much, as some of the items were of a permanent character, not merely expense. While the Executive Committee authorized a budget of seventeen thousand, three hundred twenty dollars ($17,320.00), the actual amount spent was only fourteen thousand, nine hundred thirty-three dollars and four cents ($14,933.04). The secretary cut every possible item and thus effected a

*Madison, Wis.

saving amounting to two thousand, three hundred eighty-six dollars and ninety-six cents ($2386.96). Also the office staff was reduced by one in January and the rental of the offices was cut fifty dollars ($50.00) per month beginning in May and thereafter.

By way of comparison: We had a cash decrease for the fiscal year ending June 30, 1932, of three thousand one hundred forty-three dollars and nineteen cents ($3143.19); also our income during that year was seventeen thousand six hundred forty-six dollars and twenty cents ($17,646.20) whereas our income this year was only twelve thousand, five hundred seventy-six dollars and three cents ($12,576.03), a slump of over five thousand dollars ($5000.00).

Our income for the year ending June 30, 1931 was twenty-three thousand, fifty-three dollars and ten cents ($23,053.10)—about normal. Our cash disbursed that year was approximately twenty-four thousand, two dollars and ninety-four cents ($24,002.94). Thus it will be seen that although our income during this past year was only about half that of 1931, our expenses have been pared down in almost the same proportions.

The officers of your Association have in every way endeavored to operate the National Office as economically as possible through this, the worst year of the present depression.

RECIPROCITY.

The applications for reciprocity in the past year have been at very low ebb. Those who have applied have, in a majority of cases, had positions waiting for them, and after being checked as eligible by the secretary's office, there seemed little occasion for rejections, thus the rejections have been few. The National Office has had excellent coöperation from the states in the Union (also Alaska and Puerto Rico) who are members of the N. A. B. P.

I am sure that the various member boards are working in closer harmony with the National Office to carry out the broad purpose of reciprocity for which the N. A. B. P. was organized, rather than to withhold reciprocity from applicants through some petty ruling which is entirely local in character.

LEGISLATION.

As the subject of legislation will be covered very thoroughly in the report of the Legislative Committee, I shall not take further time here with these details. I am thoroughly convinced, however, if the ideals of the N. A. B. P. are carried forward, every state embarking upon a legislative campaign should follow very closely the ideals set forth in the Model Pharmacy Law. The National Office stands ready at all times to help the boards of pharmacy and the state pharmaceutical associations in drafting or checking any law they intend to present to the legislature. If the members of the N. A. B. P. will work very closely with the secretary on all laws which pertain to pharmacy within the state, we will, in a few years, accomplish a great deal of good, not only for pharmacy but also for a healthier working arrangement between the states.

DISTRICT MEETINGS.

I know and feel that the financial situation in the various states is entirely responsible for the reduced number of district meetings held this year. I can

truthfully say that if the financial conditions had been better, the vice-presidents elected last year would have held meetings in every one of the respective districts. Each vice-president accepted his office last year to carry on the work of the national association and I, for one, want to compliment them on the efforts they put forth to arrange for district meetings. Further, I want to compliment the vice-presidents in Districts Nos. 1 and 2 for being able to hold such successful and educational meetings during such a difficult year.

I feel that these district meetings are very important as they furnish a means of working out local problems which cannot be done at the annual conventions. However, there is also a danger, namely, that the local problems may be enlarged to a point where they take precedence over national affairs. If each district in arriving at conclusions will remember that there are eight other districts and that any change in established national policies must meet with approval by a majority of the boards composing *all* the districts, we shall avoid much misunderstanding and difficulty.

The only way we can make progress as a national organization is by keeping all the states or all the districts advancing to the same degree. Those districts or individual states that are inclined to be "slow," possibly on account of geographic conditions, sparse population or for other reasons, should be willing to speed up in order not to retard national growth and advances. Those in the more advantageous situations, geographically as well as to population and educational opportunities, can of course make progress a great deal more rapidly than states without these advantages. Such states are apt to become discontented with the apparently slow rate of national progress. In order to keep the whole organization of the N. A. B. P. working smoothly, we must find a method of pepping up the so-called "backward" states, at the same time urging those at the front of the parade not to run ahead too far. Reciprocally, a state loses out as much by being ahead of the general requirements as behind.

RE-DISTRICTING.

Last year your president in his address recommended that the incoming president appoint a committee to study the problem of re-districting the various states. In the appointment of the Re-Districting Committee, I endeavored to pick members which would have a very broad view of the problem. I am sure that when Chairman Winne makes his report to this convention, he will have some suggestions to make that will overcome some of the objections of the past.

CHANGES IN CONVENTION PROGRAM.

We have endeavored this year to arrange our convention program in such a way that the vice-presidents who were able to hold district meetings will be given sufficient time to present to the convention the high-lights of their meetings, or such matters which are of national interest. We have dispensed with the reports of the other vice-presidents in order to give us sufficient time to give consideration to the meeting reports. In the convention programs which follow, I am sure that this suggestion can be enlarged upon, so that the districts can work together more closely.

If more meetings are held during the next year, I would suggest that a round table discussion of the work of the districts be arranged after the annual banquet on Monday evening. Our present program of three sessions and one joint session is so crowded that we cannot add new material without sacrificing somewhere. As the members who attend this convention do so, I am sure, in the interest of fostering better examinations, they will welcome a session devoted to this subject.

CONSOLIDATION OF EXAMINING BOARDS.

During the past year there was considerable agitation in a number of states for the consolidation of examining boards. In nearly every case, economies in the operation of the state government were given as the reason. The secretary's office prepared a "brief" of arguments against consolidation early last fall, which was supplied to any state threatened with this proposition. The fact that no complete consolidation plan was successful in any state in spite of the many threatening storms shows the alertness of the member boards in connection with the situation. Although the financial argument is the principal argument presented for consolidation, statistics on record in those states operating under the plan show that consolidation is more expensive than the individual board system, at least in so far as the professional boards are concerned.

DEPARTMENT OF EDUCATION.

Owing to the financial situation, no bulletins were issued by the Department during the past year. Director Swain who has had charge of this work since 1929 will make a report later. The director and his associates have carried a message which did a great deal of good to those members who took the time to study the monthly bulletins.

Pharmaceutical education is changing from day to day and it is hard to predict what subject matter will be important to Board members in the next three or four years. I believe a thorough study should be made of the subject matter of these bulletins, when re-issued, so as to attract more attention from the Board members and make them look forward to receiving each copy.

AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION.

I am certain that the new Council is going to do a great deal of good for all N. A. B. P. members. There is no information available since the organization meeting in Toronto. However, I feel that the three members of the Council, which I appointed to carry on the work for the National Association of Boards of Pharmacy, are men of broad vision, fully qualified to help solve our difficulties on educational standards and the necessary comprehensive study of pharmacy which will be required to set such standards.

SUPPLY AND DEMAND.

Pharmacy has for years been building up a large supply of pharmacists due to prevailing low standards. That period has reached its end. Complete statistics from the various states show a great reduction in the number of applicants taking the Board examination during the past year. The financial situation is, of course,

somewhat responsible, but remember that so far as the boards are concerned, the three-year course is still in effect until 1936. The number matriculating in college under the four-year course also shows a decrease. The results should be a benefit to the profession of pharmacy at large. The future will bring a better class of pharmacists, properly trained, with the will to devote time and money to enter the profession.

THE CHICAGO OFFICE.

It was my privilege during the past year to pay two visits to the Chicago office. I hardly believe that any member who has not visited this office can realize the vast amount and variety of work the Association is called upon to render. The secretary and his associates are to be highly complimented on the prompt and efficient way in which these various matters are disposed of. Nearly every letter received has to be handled in its own special way, and often much research in the way of gathering statistics, etc., must be done to make a proper reply, all of which takes time. The secretary has kept me informed of the more important work of the office by sending me copies of the letters going out from time to time. I have yet to hear the first complaint on the way this work is carried on and I consider this in itself the highest tribute the secretary could possibly be given.

PHARMACY AT THE CHICAGO WORLD'S FAIR.

When Secretary Christensen was president of the AMERICAN PHARMACEUTICAL ASSOCIATION, he urged that pharmacy be represented at the Chicago World's Fair. Later, the matter was brought up at the National Drug Trade Conference in Washington and the idea was given approval. A local committee was organized in Chicago to take charge of the matter and our secretary was made the chairman. The first proposition was to secure space. After a great deal of routine had been gone through, the Committee was finally successful in getting the officials of the Fair to give the space gratuitously, with pharmacy an integral part of the medical science group. Pharmacy was allotted 1700 sq. ft. of space, which has a commercial valuation of $17,000.00.

The next problem was the kind of exhibit. The committee held many meetings. Every one affiliated with any branch of the drug industry was made welcome. Experts in the exhibit field were consulted, plans were drafted, and later approved. A budget of $15,000.00 was outlined. The funds to install the exhibit were raised almost entirely by solicitation by correspondence. Manufacturers, wholesalers, retailers, journals, associations and individuals connected with pharmacy were asked to help. Much of the exhibit material was prepared by special committees in various parts of the country. The University of Wisconsin had charge of the Historical Exhibit, Purdue University of the Educational Display and the University of Illinois was called upon for much help. Committees, too, were kept busy planning various parts of the exhibit, such as the U. S. P. an N. F. display. While the cost of building and installing the exhibit has been met, the Committe is still in urgent need of funds to carry on. Any one who has not made a contribution is invited to do so as early as possible; those who have contributed are urged to help in soliciting from others. The publicity value of this exhibit for the profession of pharmacy is tremendous.

The Pharmacy Exhibit is of great interest to those within the profession who are urged to register there when visiting the Fair. But most important of all, we are reaching the public for the first time with the story of how the pharmacist serves them professionally, the educational qualifications he must possess, etc. It is inevitable that the pharmacist will be held in higher esteem by those who have seen the exhibit. I consider this work one of the most important contributions that the N. A. B. P. has made to pharmacy, the Association claiming the credit for the splendid services rendered by its secretary. He has worked day and night to carry on this job in addition to his regular duties. The N. A. B. P. is fortunate to have as an officer of this Association a man with the executive ability to carry through such a project to a successful conclusion, one who has the confidence of the entire drug industry.

IN MEMORIAM.

It is the duty of the president of this organization to pay tribute in his address to those members who have passed away during the year. The list this year fortunately is small but the men who have passed away are well known both in their respective states and to this Association. The following deaths have been reported:

John B. Ebbs, Connecticut
Gus Fischer, Missouri
W. W. Largent, Missouri
Edward B. Jones, New Jersey
W. S. Parker, North Dakota.
Dan M. Chambliss, Tennessee.

W. S. Parker was secretary of the North Dakota Board of Pharmacy for thirty-five years, from 1892 to 1927, and well beloved by the many who knew him in this body. In view of the fact that we are not calling for individual tributes this year, I will now ask you to stand for a moment to pay silent tribute to these departed members.

RECOMMENDATIONS.

From the problems presented to this organization during the past year, I would like to make the following recommendations:

1. That the various state boards encourage rather than retard reciprocity, inasmuch as this was the primary purpose and reason for organizing the Association.
2. That the extraordinary activities of this Association be discontinued, as they were in the past year, until our finances warrant their resumption.
3. That the various districts in their meetings discuss not only the problems that pertain to the district but also problems of a national character which are important enough to come up for discussion at a round table conference at this convention.
4. That more time be allowed at this convention to those districts that held meetings during the year for the purpose of discussing any recommendations or suggestions that affect the Association as a whole. If no other time is available, a round table discussion could be arranged after the banquet on Monday evening.

CONCLUSION.

The N. A. B. P. has accomplished a great deal in its thirty years of existence for the advancement of pharmacy. We have in the past year not only operated the Association considerably under the budget allowed, but we have through our

national office been able to carry the professional message of pharmacy to the outside world from the Hall of Science of the Century of Progress. This to me has been one of the big accomplishments of our Association.

It has been with a great deal of pride that I have been in a small way able to help carry on the work. The presidency of this body is the highest honor you have to bestow, and in closing this address, I want to express my sincere appreciation to the officers of the Association and my heartfelt thanks for the coöperation they have so freely given me.

In a few hours, I shall step back and a new leader will be at the helm. To him and to the new officers of the Association, I want to pledge my sincere support and coöperation for the advancement not only of the National Association of Boards of Pharmacy, but Pharmacy as a whole.

RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION AT ITS EIGHTY-FIRST ANNUAL MEETING AT MADISON, WISCONSIN, AUGUST 28–SEPTEMBER 2, 1933, UPON RECOMMENDATION OF THE HOUSE OF DELEGATES THROUGH ITS COMMITTEE ON RESOLUTIONS.

COMMITTEE ON NATIONAL LEGISLATION.

The report of the Committee on National Legislation signed by four members of the Committee and an additional statement by the one member of the Committee not signing the report were referred to the Committee on Resolutions. Careful consideration of the report and the supplementary statement reveals no conflict of opinions and as neither the report nor the statement contained any recommendations the committee suggests that both be referred to the secretary of the ASSOCIATION for disposition.

ADDRESS OF PRESIDENT W. BRUCE PHILIP.

We appreciate the careful thought given to the problems confronting our profession by President W. Bruce Philip as evidenced in his message to the AMERICAN PHARMACEUTICAL ASSOCIATION and we particularly call the attention of our members to his suggestion that definitions of the terms "drug store" and "pharmacy" be made the basis of an endeavor to limit the highest type of pharmaceutical service to those properly qualified to render such service.

ADDRESS OF CHAIRMAN J. W. SLOCUM OF THE HOUSE OF DELEGATES.

We desire to record our appreciation of the effort of Chairman Slocum in bringing the importance of the contact of the State Pharmaceutical Associations with the AMERICAN PHARMACEUTICAL ASSOCIATION through the House of Delegates, to the attention of State Associations and their officers.

We desire further to bring to the attention of the members of the AMERICAN PHARMACEUTICAL ASSOCIATION the suggestion of Chairman Slocum that the possibility of laying greater emphasis on courses in prescription writing in our medical schools be made the subject of study and possible recommendation.

SYMPOSIUM ON PROFESSIONAL PHARMACY.

We desire to commend Professor E. Fullerton Cook and his co-workers for the splendid "Symposium on Professional Pharmacy" arranged at the Second General Session of this convention.

No. 1. Reports of Delegates.

Resolved, that the Delegates to this convention be requested to prepare written reports for presentation to their respective constituent bodies and that such reports include a brief summary of the activities of the General Sessions, the sessions of the House of Delegates and the meetings

of the various Sections and Conferences together with a summary of the resolutions passed, and be it further

Resolved, that the secretary be requested to assist delegates in the preparation of these reports by supplying a résumé of the Proceedings to the end that a clearer conception of the widespread activities of the AMERICAN PHARMACEUTICAL ASSOCIATION be communicated to retail pharmacists throughout the United States.

No. 2. Code of Fair Trade Practices for the Retail Drug Trade.

Although the primary interest of the AMERICAN PHARMACEUTICAL ASSOCIATION lies in the field of the professional activity of the pharmacist it is recognized that the character and degree of service demanded by the public of the retail pharmacist is such as to require certain merchandising activities. As these activities must necessarily be regulated under the National Industrial Recovery Act, be it

Resolved, that retail pharmacists be urged to give their whole-hearted coöperation to the President of the United States in his efforts to restore normal business conditions and prosperity and be it further

Resolved, that the facilities of the AMERICAN PHARMACEUTICAL ASSOCIATION and the services of its officers and members be made available to Government agencies engaged in the preparation and enforcement of Codes of Fair Trade Practice and be it further

Resolved, that every effort be made to incorporate into such codes the provisions necessary to enable the independent pharmacist to maintain his establishment on a satisfactory business basis and be it further

Resolved, that the National Recovery Administration be urged to incorporate in any code of Fair Trade Practice for the Retail Drug Trade the right of contract of retailers with manufacturers, wholesalers or distributors relative to price agreements on trade-marked, copyrighted or identified products, and be it further

Resolved, that the actions of the President of the United States, in exempting Registered Pharmacists and other professional personnel from the provisions of the blanket code be commended and that a continuation of this policy in the final code for the retail drug industry be strongly urged in the interest of the general public welfare and be it further

Resolved, that the thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be transmitted to retiring President Philip, President-Elect Swain, Secretary Kelly and other members of the AMERICAN PHARMACEUTICAL ASSOCIATION who have been active in behalf of the independent retailer in the discussions with Government officials and others on this topic.

No. 3. Dispensing of Liquor for Medicinal Purposes.

Resolved, that the Officers and Council of the AMERICAN PHARMACEUTICAL ASSOCIATION be instructed to take such steps as they may deem necessary in the event of repeal of the 18th amendment, to prevent the sale of beverage liquor in pharmacies or drug stores, and be it further

Resolved, that it shall be the declared policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to favor the dispensing of liquor for medicinal purposes only on physicians' prescriptions.

No. 4. Federal Food and Drug Law.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION record its approval of the proposed changes in the Federal Food and Drug Law in so far as they provide for more effective protection of the public health, and be it further

Resolved, that in the interest of a sound public policy the delegation of arbitrary discretionary powers in connection with the enforcement of Food and Drug legislation be disapproved.

No. 5. Study of Closer Coöperation of American Pharmaceutical Association and National Association of Retail Druggists.

In view of the several suggestions that have come before the AMERICAN PHARMACEUTICAL ASSOCIATION during this annual meeting and in view of the frequently expressed sentiment of pharmacists throughout the United States in favor of the development of closer coöperation between the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION, be it

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION hereby expresses its deep interest in this subject and authorizes its Council to appoint members of a joint commission to make a careful study of the matter, provided the organization of such a commission is agreeable to the National Association of Retail Druggists.

No. 6. Technical Equipment in Pharmacies.

Resolved, that Boards of Pharmacy be urged to develop minimum standards of technical equipment to be required of pharmacies engaged in the compounding of prescriptions and in supplying other professional pharmaceutical services.

No. 7. Pharmacy Week.

Resolved, that the members of the AMERICAN PHARMACEUTICAL ASSOCIATION be encouraged to continue their support of the movement to bring the professional aspects of pharmacy to the attention of the public through the observance of National Pharmacy Week.

No. 8. Recognition of Pharmacists in Government Service.

Resolved, that the efforts of the AMERICAN PHARMACEUTICAL ASSOCIATION to obtain recognition of pharmacy in the various branches of the Government services commensurate with the high type of professional service rendered, be continued.

No. 9. Coöperation with Surgeon General of U. S. Army for a More Satisfactory Type of Pharmaceutical Service.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION continue its active coöperation with the Surgeon General of the United States Army in bringing about a more satisfactory type of pharmaceutical service in the Army and proper recognition of the personnel rendering this service.

No. 10. Thanks to Council on Medical Education and Hospitals of American Medical Association.

Resolved, that the thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be expressed to the Council on Medical Education and Hospitals of the American Medical Association for the favorable attitude expressed by resolution of this body on the subject of hospital pharmacies and their supervision and be it further

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION continue its endeavors to provide for the supervision of all pharmaceutical work in hospitals by registered pharmacists.

No. 11. Historical Material for Museum and Library of Headquarters Building.

Resolved, that the Local Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, State Pharmaceutical Associations, Boards and Colleges of Pharmacy as well as other organizations and individuals interested in the progress and development of pharmacy be urged to supply documents of historical interest, relics and museum material to the museum and library of the Headquarters Building of the AMERICAN PHARMACEUTICAL ASSOCIATION at Washington and be it further

Resolved, that organizations and individuals interested in the progress of pharmacy be urged to prepare papers on matters of historical interest for presentation to the Section on Historical Pharmacy of the AMERICAN PHARMACEUTICAL ASSOCIATION.

No. 12. Survey of Resolutions of Former Conventions.

Resolved, that a survey of the Proceedings and JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be made for the purpose of assembling and classifying the resolutions passed at the annual conventions. It is suggested in this connection that this task be assigned to the Section on Historical Pharmacy and that the first report be limited to a survey of the resolutions adopted in the past twenty-five years.

No. 13. Official Recognition of the Pharmaceutical Syllabus.

Resolved, that we express our appreciation of the work of the National Pharmaceutical Syllabus Committee culminating in the publication of the Syllabus for the four-year course in pharmacy and that we concur in the recommendation of Chairman J. G. Beard of the Syllabus

Committee to the effect that the Syllabus be given official recognition by colleges and boards of pharmacy.

No. 14. Appreciation of the Efforts of the Headquarters Building Committee.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION record its appreciation of the efforts of the Headquarters Building Committee in carrying the splendid building project in the City of Washington to completion.

No. 15. Thanks to Committee on Century of Progress Pharmacy Exhibit.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its appreciation and thanks to the Committee on World's Fair Exhibit for the excellent manner in which they have arranged for the portrayal of the Progress of Pharmacy at the Century of Progress in Chicago and urge all pharmacists to make a financial contribution toward defraying the expenses of this splendidly successful undertaking.

No. 16. Congratulations and Appreciation on Completion and Publication of Prescription Ingredient Survey.

Resolved, that the congratulations and appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION be expressed to Chairman E. N. Gathercoal of the Committee on National Formulary and his co-workers for the completion and publication of the Prescription Ingredient Survey.

No. 17. Resolution of Thanks to Hosts.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION extend its sincere thanks to Local Secretary Emerson D. Stanley, Chairman Oscar Rennebohm and the members of the Convention Committee, Mrs. Adolph F. Menges, Chairman of the Women's Committee, and the members of this Committee, Dr. and Mrs. Edward Kremers, as well as the many other Wisconsin pharmacists for their splendid hospitality.

No. 18. Resolution on Death of Dr. Henry G. Greenish.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION record its sorrow at the demise of Dr. Henry G. Greenish, distinguished British pharmacognosist and pharmaceutical educator and be it further

Resolved, that the condolences of the AMERICAN PHARMACEUTICAL ASSOCIATION be expressed to the British Pharmaceutical Society and to the members of the family of the deceased.

ABSTRACTS OF PAPERS PRESENTED BEFORE SCIENTIFIC SECTION, A. PH. A.

"A Comparative Study of the Maryland and the Official Sennas," by Frank J. Slama.—A comparative study is made of the following six sennas, *Cassia Senna*, *C. angustifolia*, and four Maryland sennas, *C. Marilandica*, *C. Medsgeri*, *C. nictitans* and *C. Chamaecrista*. The stomata, neighboring cells, epidermal cells and the distribution of epidermal hairs of the upper and lower surfaces of the leaflets are compared. A study is also made of the margins, apices, peticules, glands on the petioles and the cross sections of the leaflets. From the differences noted, the sennas are separated into three groups: Group I, the official sennas; Group II, *C. Marilandica* and *C. Medsgeri*, and Group III, *C. nictitans* and *C. Chamaecrista*.

"The Co-Fe-Cu Fluids as Applied to U. S. P. Tests," by H. V. Arny and A. Taub.—Report of a study carried on at the request of the U. S. P. sub-committee on organic chemicals of the colors produced in performing the test of U. S. P. IX for "readily carbonizable substances." The colors produced by the action of sulphuric acid on 48 official organic chemicals in Lovibond units and matches prepared from Arny's "CO-FE-CU" standardized colored fluids will be reported and demonstrated. Prior work by Arny and by Taub on matching the color of official fixed oils will be reviewed with particular reference to the inclusion of these color comparisons in U. S. P. XI.

"Medicinal Cod Liver Oil—Observations on Color and Viscosity," by George E. Ewe.—The origin of the color of cod liver oil is discussed and the influence of various factors upon the color and viscosity of this oil is recorded and discussed.

THE PROFESSIONAL PHARMACY.*

BY FRANK A. DELGADO AND ARTHUR A. KIMBALL, U. S. DEPARTMENT OF COMMERCE

(*Continued from page 782.*)

CHAPTER V. PRESCRIPTION INVENTORY PROBLEMS AND INGREDIENT ANALYSIS.

The information in this chapter, and the list of leading ingredients at the end of the report, should be of particular value to the pharmacist who is opening a new drug store, as an aid in ordering his basic or opening prescription department inventory, and to wholesalers in preparing a suggested list for the opening order. With approximately 2500 pharmacy students graduating and 1800 new drug stores opening every year, the occasion for an opening order happens not infrequently. However, most pharmacists will recognize the inventory problem as one which has been very trying to them and it is hoped that some of the suggestions made in this chapter will assist them in solving this problem.

Later in this chapter it is shown that a maximum of 1274 different ingredients is required to fill 10,000 prescriptions. However, only 358, or 28 per cent of these 1274 ingredients will be called for as many as 10 times each in filling the 10,000 prescriptions. As the average drug store does not fill many more than 10,000 prescriptions in three years, it will be seen that 500 prescription department items distributed judiciously among chemicals, galenicals and manufacturers' specialties should prove to be an adequate opening order. Of course, these 500 items should be made up of those items which are shown in the list of leading ingredients to have been at least in fairly good demand. In a given community there may be several items not on the list, which because of unusual circumstances are in quite frequent demand. However, the wholesaler could bring such items to the attention of the druggist. The list of leading ingredients does not include manufacturers' specialties because the policy of the Bureau of Foreign and Domestic Commerce does not permit the publishing of trade-name items. However, the United States Pharmacopœia and National Formulary Revision Committees have published lists of leading ingredients based on their extensive prescription studies, which should be an excellent medium for selecting an assortment of manufacturers' specialties most frequently prescribed. These lists could also be used to check the list of chemicals, drugs and galenicals published in this report.

Of course, the new drug store does not ordinarily have a very large prescription business at the start, but has to build up this business over a period of years. Later in this chapter, a tabulation showing the number of prescriptions filled the first year in business by a number of drug stores is shown, and this business is compared with their present prescription business. If the new drug store averages one prescription a day for the first year, or 365 prescriptions for the year, approximately 300 different ingredients will be needed. Table 33 shows the number of different ingredients required for the first 500 prescriptions, and for each succeeding block of 500 prescriptions.

The average number of prescription department items in each of the 11 commercial type stores studied in the survey (from preliminary figures which may be reduced 5 or 10 per cent after editing to combine similar items) was 1474, of which a great number were not called for at all during the year of the survey. The average store would have to fill considerably more than 10,000 prescriptions a year if each of 1474 different items was to be used at least once in the year. In 8 commercial type drug stores studied in this survey, an average of 608 different ingredients was required to fill an average of 1883 prescriptions per store. It will be seen that more than half of the 1474 ingredients stocked were not called for even a single time in filling nearly 2000 prescriptions.

Among other disadvantages of a prescription department inventory which is cluttered with many inactive items is the expense involved. Any operating improvement which cuts down expense is particularly important during this time of depression, especially in view of the increasing number of failures in the industry. One reliable report states that: "The increase in the number of failures among wholesalers and retailers (in the drug industry) has been continuous

* See Table of Contents page 671, July issue of the JOURNAL.—This installment covers Chapters V and VI, which see.

since 1930, with the total for 1932 rising to 1387, the highest recorded in the last five years, and comparing with 1171 in 1931." The report just quoted is based on figures compiled by R. G. Dun & Company.

OPENING BUSINESS AND EXTENT OF GROWTH OF THE DRUG STORE'S PRESCRIPTION DEPARTMENT.

The first part of the following table shows the opening and present business in the prescription departments of 10 of the commercial type drug stores studied in connection with the National Drug Store Survey in St. Louis, Mo. These 10 stores had been in business an average of about 9 years in 1931 when the statistics were gathered, and in all but one case were still managed by the original proprietor. The 10 stores averaged 8.6 prescriptions each per day in the first year, although this average is distorted somewhat by the fact that refills are included for five stores. In five cases no record had been kept of the number of refills handled the first year, but generally the refill business of a store is not of great importance during its first year. For the year ending April 30, 1931, the 10 stores averaged 11.9 prescriptions each per day, including refills, an average increase of 3.3 prescriptions each, daily. Eight of the 10 stores individually had an increased prescription business. After a drug store has been established for a number of years, the refill business generally becomes of considerable importance. The average gain of the 10 stores is almost entirely accounted for by the refill business. If the refills were omitted from consideration in the year ending April 30, 1931, the five stores which did not keep a record of refills during their opening year would average a loss in prescription compounding, as compared with the first year.

For the sake of comparison, a similar study was made in 13 drug stores located in two Eastern cities. These 13 stores had been in business for an average of about 15 years each when this study was made in 1932 and 1933. These stores averaged 7 prescriptions each a day during their first year of operation, and average 12.4 prescriptions each daily at the present time, an increase of 5.4 prescriptions each per day. For only 4 of the 13 stores are refills included. If refills were added to the prescriptions shown for the other 9 stores, the average daily prescription activity would probably be a noticeably higher figure, and some of the 6 stores which show a decrease in the number of prescriptions filled would probably show an increased prescription practice.

It is interesting to note that those stores which had the smallest opening prescription service tended to have an increased business, while the opposite was true for those stores which started with a good prescription practice the first year. However, one store which filled an average of 9.9 prescriptions daily its first year (1921), quadrupled the number of its prescriptions, and another store, which averaged 10.3 prescriptions daily in 1916 when it opened, nearly tripled the number of its prescriptions. On the other hand, one store filled an average of less than one prescription a day in 1929 when it opened, and in 1932 showed only a slight increase, at that time averaging only 1.4 prescriptions daily.

The facts shown in the accompanying table point out strongly the necessity of using judgment and care in selecting the opening stock for the prescription department of a drug store. The average new store will fill only from 2500 to 3000 prescriptions its first year, and thus only a fraction of the prescription department items which could be stocked will actually be prescribed the first year. The wise plan is to purchase in the opening order only those items which are known to have frequent occurrence (and, of course, items of an emergency nature), and then to obtain other items as they are actually prescribed. Care should also be used when placing the opening order of containers, corks and other accessories and supplies, to avoid overstocking.

These actual examples show clearly how some stores build up their prescription business, in some cases after starting with a good volume, while in other stores this phase of the business is evidently neglected, or at least not promoted to the fullest extent. Some proprietors of stores who started with a nice prescription volume must have taken this as a matter of course, doing nothing to build it further or even to keep up the opening volume. Of course, certain factors, such as location of the store, limit the possibilities of increasing the volume of prescriptions; some stores would never be able to increase the volume to 40 prescriptions a day, for example. But in most cases it is possible to substantially increase the prescription business over the volume of the opening year, and with proper management the profit possibilities of the prescription department are greatly enhanced as the volume becomes greater. Certainly, for example, the

proprietor of the store which after three years has only increased its prescription business to an average of 1.4 prescriptions a day has not made any noticeable effort to promote the professional phase of the drug store.

The questionnaire professional stores in 1932 had been in business for an average of 17 years. During the opening year, these stores averaged 23.5 prescriptions each per day, while in 1932 they averaged 73 prescriptions each daily. Nine of these professional stores started quite inauspiciously, averaging only from 2 to 10 prescriptions each per day during the first year. However, five stores started with a large volume, averaging from 31 to 150 prescriptions each per day in the opening year. Some of those stores which started with such a small volume are

TABLE XXVII.—COMPARISON OF OPENING AND PRESENT PRESCRIPTION BUSINESS IN 10 COMMERCIAL TYPE DRUG STORES IN ST. LOUIS, MO.

Date Store Opened.	First Year in Business. No. of Prescriptions.	First Year in Business. Daily Average.	Year Ending April 30, 1931. No. of Prescriptions Including Refills.	Year Ending April 30, 1931. Daily Average.	Daily Net Change.
1924	792	2.2	2394	6.5	+4.3
1925	1267[1]	3.5[1]	4046	11.1	+7.6
1926	1496[1]	4.0[1]	2269	6.2	+2.2
1929	2189	6.0	5150	14.1	+8.1
1906	2522[1]	6.9[1]	4561	12.5	+5.6
1911	2571	7.0	4126	11.3	+4.3
1924	2731	7.5	2314	6.3	−1.2
1924	5266[1]	14.4[1]	7197	19.7	+5.3
1924	6237	17.0	3675	10.0	−7.0
1926	6499[1]	17.8[1]	7883	21.6	+3.8
Average	3157	8.6	4362	11.9	+3.3

[1] Includes refills.

COMPARISON OF OPENING BUSINESS AND PRESENT PRESCRIPTION BUSINESS IN DRUG STORES IN TWO EASTERN CITIES.

Date Store Opened.	First Year in Business. No. of Prescriptions.	First Year in Business. Daily Average.	Most Recent Year.[1] No. of Prescriptions.	Most Recent Year.[1] Daily Average.	Daily Net Change.
1929	306	0.8	521	1.4	+ 0.6
1872	1161	3.2	2,526	7.0	+ 3.8
1928	1200	3.3	3,500	9.6	+ 6.3
1925	1828	5.0	8,769	24.0	+19.0
1889[2]	1852	5.1	6,066	16.6	+11.5
1920	2127	5.8	1,705	4.7	− 1.1
1926	2500	6.8	1,625	4.5	− 2.3
1923	2835	7.8	1,954	5.4	− 2.4
1917	2948	8.1	723	2.0	− 6.1
1921[2]	3600	9.9	14,858	40.7	+30.8
1916[2]	3756	10.3	9,862	27.0	+16.7
1925	4053	11.1	2,494	6.8	− 4.3
1928[2]	5064	13.9	4,099	11.2	− 2.7
Average	2556	7.0	4,516	12.4	+ 5.4

[1] In some cases the calendar year 1932 was used and in other cases the year from April 1932 to April 1933 was used. [2] Refills are included in the prescriptions shown for these stores.

NOTE: Another store studied had opened on June 1, 1932, and thus could only report its prescription business for the first 10 months, during which time it averaged only 1.3 prescriptions per day.

good examples of how a prescription business can be built up from almost nothing until the store has such a large volume that it changes from a commercial type store to a professional pharmacy.

PRESCRIPTION INGREDIENT REQUIREMENTS AND OCCURRENCE BY TYPE OF INGREDIENT IN PROFESSIONAL AND COMMERICAL TYPE DRUG STORES.

An analysis was made of 10,000 prescriptions filled by professional pharmacies A and B and 10,000 prescriptions filled in commercial type drug stores to determine the number of different ingredients required and the number of times these different ingredients were used in filling these prescriptions.

It was found that a total of 1186 different items were prescribed in the 10,000 prescriptions from the professional pharmacies, while it would be necessary to carry 1274 different items in stock to fill the 10,000 prescriptions from the commercial type drug stores. The 1186 different ingredients of the professional store prescriptions were actually used 20,077 times, or an average of about 2 ingredients per prescription. This compares with an average of over 2.5 ingredients per prescription in the 10,000 prescriptions filled by commercial type stores, the 1274 different items required in filling these prescriptions being used a total of 25,196 times.

In both cases, chemical ingredients amounted to less than one-fifth of the total number of different ingredients, but were called for in the prescriptions about as often as galenicals and manufacturers' specialties combined. The chemical ingredients were much more active than specialties or galenicals, showing that chemicals have the least and specialties the most chance of becoming "shelf-warmers." For example, in the 20,000 prescriptions from both types of stores, the 280 different chemicals were called for an average of 80.8 times each, while the 700 galenicals were prescribed an average of only 18.7 times each, and the 745 specialties only 12.8 times each.

Of the 1186 different items which would have to be stocked to fill the 10,000 professional

TABLE XXVIII.—NUMBER OF DIFFERENT INGREDIENTS, BY TYPE OF INGREDIENT, REQUIRED IN FILLING PRESCRIPTIONS IN PROFESSIONAL AND COMMERCIAL TYPE DRUG STORES, AND THE NUMBER OF TIMES EACH OF THE DIFFERENT TYPES OF INGREDIENTS OCCURRED.

	10,000 Professional Store Prescriptions.				
Type of Ingredient.	Number of Different Ingredients.	Per Cent of Total.	Number of Times Ingredients Occurred.	Per Cent of Total.	Average Number of Times Each Ingredient Occurred.
Chemicals	217	18.3	9,628	47.9	44.4
Galenicals	436	36.7	5,455	27.2	12.6
Specialties	533	45.0	4,994	24.9	9.4
Total	1186	100.0	20,077	100.0	17.0

	10,000 Commercial Type Drug Store Prescriptions.				
Type of Ingredient.	Number of Different Ingredients.	Per Cent of Total.	Number of Times Ingredients Occurred.	Per Cent of Total.	Average Number of Times Each Ingredient Occurred.
Chemicals	235	18.4	12,993	51.6	55.3
Galenicals	554	43.5	7,653	30.4	13.8
Specialties	485	38.1	4,550	18.0	9.4
Total	1274	100.0	25,196	100.0	19.8

	Total: 20,000 Prescriptions.				
Type of Ingredient.	Number of Different Ingredients.	Per Cent of Total.	Number of Times Ingredients Occurred.	Per Cent of Total.	Average Number of Times Each Ingredient Occurred.
Chemicals	280	16.2	22,621	50.0	80.8
Galenicals	700	40.6	13,108	28.9	18.7
Specialties	745	43.2	9,544	21.1	12.8
Total	1725	100.0	45,273	100.0	26.2

store prescriptions, 533 or 45 per cent, would be manufacturers' specialties. Only 38.1 per cent of the 1274 different items called for in the 10,000 prescriptions from the commercial type drug stores were specialties, however. Nevertheless, manufacturers' specialties were called for only 24.9 per cent of the time in the professional store prescriptions and only 18 per cent of the time in the prescriptions filled by commercial type drug stores.

It should be remembered that the professional store prescriptions were obtained from but two pharmacies, while the 10,000 commercial type store prescriptions were obtained from six commercial type pharmacies, including a chain store unit. Thus a larger number of physicians wrote the 10,000 commercial type store prescriptions than wrote the 10,000 prescriptions filled by the professional drug stores. This explains the fact that a larger number of different items were called for in the 10,000 prescriptions from the commercial type drug stores.

If the 10,000 prescriptions from professional pharmacies and the 10,000 from commercial type pharmacies are combined, the 20,000 prescriptions would require a total of 1725 different ingredients. After filling the 10,000 prescriptions from the professional pharmacies, which required 1186 different ingredients, only 539 additional different ingredients would be required to fill the 10,000 commercial type store prescriptions. Only 63 additional chemicals would have to be stocked, but 264 galenicals and 212 specialties in addition to those called for in the 10,000 professional store prescriptions would be required.

TABLE XXIX.—FREQUENCY OF OCCURRENCE OF INGREDIENTS IN PROFESSIONAL AND COMMERCIAL TYPE DRUG STORES.

	10,000 Prescriptions from Professional Pharmacies.			
Occurrence of Ingredients.	Number of Ingredients.	Per Cent of Total.	Number of Occurrences.	Per Cent of Total.
Once	375	31.62	375	1.87
Twice	150	12.65	300	1.49
3 times	87	7.34	261	1.30
4 times	55	4.64	220	1.09
5–9 times	196	16.52	1,335	6.65
10–25 times	161	13.57	2,525	12.58
26–50 times	66	5.56	2,494	12.42
51–100 times	57	4.81	4,037	20.11
101–200 times	25	2.11	3,355	16.71
201–500 times	13	1.10	4,031	20.08
Over 500 times	1	0.08	1,144	5.70
Total	1186	100.00	20,077	100.00

	10,000 Prescriptions from Commercial Type Stores.			
Occurrence of Ingredients.	Number of Ingredients.	Per Cent of Total.	Number of Occurrences.	Per Cent of Total.
Once	407	31.95	407	1.62
Twice	171	13.42	342	1.36
3 times	103	8.08	309	1.23
4 times	69	5.42	276	1.10
5–9 times	166	13.03	1,089	4.32
10–25 times	177	13.89	2,808	11.14
26–50 times	72	5.65	2,619	10.39
51–100 times	53	4.16	3,629	14.40
101–200 times	35	2.75	5,059	20.08
201–500 times	15	1.18	4,515	17.92
Over 500 times	6	0.47	4,143	16.44
Total	1274	100.00	25,196	100.00

FREQUENCY OF OCCURRENCE OF PRESCRIPTION INGREDIENTS.

In the table below, the 1274 different ingredients occurring in 10,000 prescriptions from commercial type drug stores and the 1186 different ingredients prescribed in 10,000 prescriptions

filled by professional pharmacies are classified according to the number of times each was prescribed in 10,000 prescriptions. In both groups of prescriptions, more than half of the different ingredients prescribed were used very infrequently, being called for less than five times each. These infrequently used ingredients were called for a total of only 2490 times in 20,000 prescriptions. On the other hand, those ingredients which were prescribed five times or more each were called for a total of 42,783 times in the 20,000 prescriptions. Thus, when a physician wrote an item on his prescription blank, in over 94 per cent of the cases that item was one of the minority group of items occurring more than five times.

Of course, those items which individually occurred a large number of times were of outstanding importance. For example, in the 10,000 prescriptions from the commercial type stores there were 56 items which were each prescribed at least 100 times. These 56 items represented only 4.4 per cent of the 1274 different items prescribed. Yet these 56 leading ingredients were prescribed a total of 13,717 times, or in 54.4 per cent of the 25,196 occurrences of ingredients. A similar situation existed in the case of the ingredients which had the greatest demand in the professional store prescriptions.

It is interesting to note the consistency between the two blocks of prescriptions as regards the number of ingredients in each frequency group, and the standing of each frequency group in the total number of occurrences. In both the commercial type and professional store prescriptions, for example, approximately 32 per cent of the different ingredients were prescribed just one time each, and in both cases these "shelf-warmers" represented less than 2 per cent of the total number of occurrences of ingredients.

Thus it is shown that only a comparatively small number of prescription items out of the many usually stocked are important from a movement standpoint. For example, in the professional store prescriptions, only 519 out of the 1186 different ingredients prescribed were called for as many as five times or more. If these 519 ingredients only had been stocked, they would have yet been sufficient for 94 out of every 100 ingredients prescribed. Or, in only 6 cases out of 100 would an item not in stock have been prescribed. Yet the items of rare occurrence ran the number of ingredients required in filling the 10,000 professional store prescriptions up to a total of 1186.

NUMBER OF INGREDIENTS REQUIRED PER PRESCRIPTION.

Table XXX shows the number of ingredients used per prescription in two professional drug stores. In both stores slightly less than half of all the prescriptions studied consisted of only one ingredient. Only about 28 per cent of the narcotic prescriptions, in both stores, contained just a single ingredient. Thus it will be seen that over half of the prescriptions in both stores contained more than one ingredient, and a considerable number contained six, seven or eight ingredients. As a total for both stores, nonnarcotic prescriptions contained an average of two ingredients, while narcotics averaged 2.7 ingredients. The average number of ingredients per prescription was higher in professional Store A than in Store B for both types of prescriptions.

It is somewhat surprising to note that the average number of ingredients per prescription was considerably lower in these professional pharmacies than in the 13 usual commercial type drug stores, reported in the first prescription department report. The 13 usual type drug stores had an average of 2.5 ingredients per prescription, the average being 2.4 for nonnarcotic and 3.2 for narcotic prescriptions. This difference is probably brought about by the much larger variety of manufacturers' trade-name specialties, biologicals, alergics, etc., carried by professional pharmacies. The professional drug stores carry a wider variety of prescription ingredients than do the commercial type stores, having on hand many items which are called for rarely. Obviously, simple, as well as difficult, prescriptions are filled by the professional stores. This fact suggests that professional stores doing a large business might allocate all single-ingredient and simple prescriptions to their younger and less experienced personnel. Naturally, such prescription clerks would be expected to fill more prescriptions of this type, in a given period, than if they were filling more difficult prescriptions.

Despite statements frequently made to the contrary, the average number of ingredients contained in a prescription has not decreased, or at least, not in the professional store herein studied.

TABLE XXX.—NUMBER OF INGREDIENTS PER PRESCRIPTION BY TYPE OF PRESCRIPTION, FOR TWO PROFESSIONAL DRUG STORES IN 1930–1931.

Number of Ingredients.	Nonnarcotic. Store A. Number of Prescriptions.	Nonnarcotic. Store A. Per Cent.	Nonnarcotic. Store B. Number of Prescriptions.	Nonnarcotic. Store B. Per Cent.	Narcotic. Store A. Number of Prescriptions.	Narcotic. Store A. Per Cent.	Narcotic. Store B. Number of Prescriptions.	Narcotic. Store B. Per Cent.	Nonnarcotic and Narcotic. Store A. Number of Prescriptions.	Nonnarcotic and Narcotic. Store A. Per Cent.	Nonnarcotic and Narcotic. Store B. Number of Prescriptions.	Nonnarcotic and Narcotic. Store B. Per Cent.
1	1841	45.0	1496	49.9	299	27.7	142	28.4	2140	41.4	1638	46.8
2	810	19.8	736	24.6	153	14.2	170	34.0	963	18.6	906	25.9
3	747	18.3	522	17.4	299	27.7	110	22.0	1046	20.2	632	18.1
4	458	11.2	193	6.4	137	12.7	43	8.6	595	11.5	236	6.7
5	182	4.4	46	1.5	126	11.7	30	6.0	308	6.0	76	2.2
6	43	1.0	6	0.2	42	3.9	3	0.6	85	1.7	9	0.3
7	8	0.2	..	...	19	1.8	2	0.4	27	0.5	2	0.0+
8	3	0.1	1	0.0	3	0.3	...	...	6	0.1	1	0.0+
Total	4092	100.0	3000	100.0	1078	100.0	500	100.0	5170	100.0	3500	100.0

Type of Prescription.	Store A. Number of Ingredients.	Store A. Average per Prescription.	Store B. Number of Ingredients.	Store B. Average per Prescription.	Total Both Stores. Number of Ingredients.	Total Both Stores. Average per Prescription.
Nonnarcotic	8,782	2.1	5580	1.9	14,362	2.0
Narcotic	3,089	2.9	1166	2.3	4,255	2.7
Total	11,871	2.3	6746	1.9	18,617	2.1

In order to ascertain whether or not there has been any change in the average number of ingredients per prescription in the past 20 years, 1000 prescriptions filled in 1910 and 1000 filled in 1920 in professional Store A were examined, and the results are shown in the table below. It will be seen that there is little change in the average number of ingredients per prescription for all prescriptions studied, being 2.2 ingredients in 1910 and 2.3 in 1920 and 1930. However, when nonnarcotic and narcotic prescriptions are considered separately, the average number of ingredients per prescription for each type was a little higher in 1930 than in 1920.

TABLE XXXI.—NUMBER OF INGREDIENTS PER PRESCRIPTION BY TYPE OF PRESCRIPTION IN PROFESSIONAL STORE A IN 1910 AND 1920.

Number of Ingredients.	1910. All Prescriptions. Number of Prescriptions.	1910. All Prescriptions. Per Cent.	1920. Nonnarcotic. Number of Prescriptions.	1920. Nonnarcotic. Per Cent.	1920. Narcotic. Number of Prescriptions.	1920. Narcotic. Per Cent.	1920. All Prescriptions. Number of Prescriptions.	1920. All Prescriptions. Per Cent.
1	397	39.7	403	47.4	34	22.7	437	43.7
2	242	24.2	152	17.9	29	19.3	181	18.1
3	204	20.4	135	15.9	28	18.7	163	16.3
4	110	11.0	101	11.9	24	16.0	125	12.5
5	27	2.7	42	4.9	23	15.3	65	6.5
6	14	1.4	11	1.3	5	3.3	16	1.6
7	4	0.4	3	0.4	2	1.3	5	0.5
8	1	0.1	...	...	...	...	..	...
9	..	...	...	...	4	2.7	4	0.4
10	1	0.1	1	0.1	1	0.7	2	0.2
11	..	...	2	0.2	...	...	2	0.2
Total	1000	100.0	850	100.0	150	100.0	1000	100.0

Type of Prescription.	1910. Number of Ingredients.	1910. Average per Prescription.	1920. Number of Ingredients.	1920. Average per Prescription.
Nonnarcotic	Unknown	Unknown	1845	2.2
Narcotic	Unknown	Unknown	477	3.2
Total	2198	2.2	2322	2.3

In 1910, 39.7 per cent of the prescriptions studied in Store A contained only one ingredient, as compared with 43.7 per cent in 1920 and 41.4 per cent in 1930, showing that there is little variation in this respect. The highest number of ingredients found in a single prescription in 1930 was 8, while in 1910 and 1920 as many as 10 or 11 ingredients were used in filling a single prescription in a few cases.

PRIVATE FORMULA PRESCRIPTIONS.

Of the 5474 prescriptions studied in professional Store A, 304 or 5.5 per cent were private formula prescriptions. These prescriptions were studied separately and the results of this study are presented in the table below. The private formula prescriptions are not included in most of the other tables in this report, and for this reason are given special treatment here. No private formula prescriptions were studied for professional Store B, inasmuch as this store filled very few prescriptions of this type.

The table shows that physicians practicing internal medicine and dermatologists wrote a large part of these private formula prescriptions, together writing about 75 per cent of the 304 prescriptions. Of the 38 doctors practicing internal medicine, 8 wrote private formula prescriptions. These 8 doctors averaged 16.9 private formula prescriptions each, this type of prescription representing 13.3 per cent of all their prescriptions studied. Private formula prescriptions occupied an even more important place in the business of the individual dermatologist, an average of 23 such prescriptions being written by each dermatologist who wrote this type of prescription. However, 60.5 per cent of the private formula prescriptions were written by two doctors. One, who practiced internal medicine, wrote 102 such prescriptions, while the other, a dermatologist, wrote 82 private formula prescriptions. The former ranked third among the doctors contributing the prescriptions studied in this store for 1930, while the latter was second.

It is interesting to note that of the 304 private formula prescriptions, only 17 were narcotic prescriptions. Of these 17 narcotic prescriptions, 6 were written by one doctor and 5 by another.

Although not shown in the table, Stores C and D both manufactured from physicians' private formulas. In Store C approximately 25 per cent and in Store D approximately 10 per cent of the total prescription business is of a private formula character, according to the estimates of the proprietors.

Sixty per cent of the 35 questionnaire stores do not fill many private formula prescriptions, but the other 40 per cent fill a large number of such prescriptions. Eighteen of the questionnaire stores prepare and submit formulas to physicians.

TABLE XXXII.—PRIVATE FORMULA PRESCRIPTIONS BY TYPES OF PRACTICE OF PHYSICIANS PRESCRIBING THEM.

Type of Practice.	Number of Doctors Writing Private Formula Prescriptions.	Total Number of Doctors.	Number of Private Formula Prescriptions.	Per Cent of Total Private Formula Prescriptions.	By Doctors Writing Private Formula Prescriptions.		
					Number of Other Prescriptions Written.	Per Cent Private Formula.	Average Number of Private Formula Prescriptions per Doctor.
Internal Medicine	8	38	135	44.41	879	13.3	16.9
Dermatology	4	7	92	30.26	367	20.0	23.0
Oculists	4	28	30	9.87	56	34.9	7.5
Ear, Nose and Throat	4	16	21	6.91	115	15.4	5.3
General Practice	6	58	14	4.60	254	5.2	2.3
Neurology	1	5	6	1.97	8	42.9	6.0
Surgery	1	21	2	0.66	36	5.3	2.0
Gynecology	1	14	1	0.33	13	7.1	1.0
Unknown	3	".."	3	0.99	1	75.0	1.0
Total	32		304	100.00	1729	15.0	9.5

NUMBER OF ADDITIONAL INGREDIENTS REQUIRED IN FILLING SUCCESSIVE BLOCKS OF 500 PRESCRIPTIONS.

The study presented in Table XXXIII, below, is believed to give a clear picture of the difficulties confronting the pharmacist, as regards the prescription ingredients which must be stocked to meet the demand of his customers. Ten thousand prescriptions from two professional pharmacies and 10,000 from commercial type drug stores were the basis of this analysis. In each group, the prescriptions were considered in blocks of 500 prescriptions.

In the professional stores, for example, 328 different ingredients were required in filling the first 500 prescriptions. In the next 500 prescriptions, 121 new ingredients were required. Even after filling 5000 prescriptions, when the pharmacist might think he had built up a pretty widely assorted stock of prescription ingredients to care for his prescription demands, 34 new ingredients not called for previously are required. With each succeeding block of 500 prescriptions, the number of new ingredients required generally diminishes, but even in the 20th block, 10 new ingredients were prescribed.

TABLE XXXIII.—STUDY OF 10,000 COMMERCIAL TYPE DRUG STORE PRESCRIPTIONS AND 10,000 PRESCRIPTIONS FROM TWO PROFESSIONAL PHARMACIES, TO DETERMINE THE NUMBER OF ADDITIONAL INGREDIENTS CALLED FOR IN EACH BLOCK OF 500 PRESCRIPTIONS.

Block.	Number of Different Ingredients Not Appearing in a Previous Block. Professional.	Commercial.	Block.	Number of Different Ingredients Not Appearing in a Previous Block. Professional.	Commercial.
1st	328	303	11th	34	35
2nd	121	173	12th	29	58
3rd	96	110	13th	19	50
4th	74	73	14th	26	21
5th	69	62	15th	29	19
6th	51	69	16th	41	20
7th	47	28	17th	32	15
8th	41	44	18th	15	15
9th	52	57	19th	20	47
10th	52	35	20th	10	40
			Total	1186	1274

It will be noted that the same general condition existed in the 10,000 commercial type store prescriptions, except that a larger number of different ingredients was required, 1274 for the 10,000 prescriptions as against 1186 for the 10,000 prescriptions from the professional pharmacies. The probable reason for this is that a larger number of doctors had a part in writing the prescriptions, than was true for the professional store prescriptions, which were all obtained from two professional pharmacies. Generally, a physician prescribes within a fairly limited range of ingredients, so the smaller the number of physicians contributing to the prescription business, the fewer different ingredients are required.

Blocks 19 and 20 in the commercial store prescriptions show a surprising number of new ingredients required, 47 and 40, respectively, so further explanation should be made. The 1000 prescriptions in these two blocks were taken from a chain store unit, and due to the wide variety of practice and large number of physicians contributing prescriptions filled by this chain store unit, located in the hub of the metropolitan district of St. Louis, this large number of ingredients appeared for the first time in the prescriptions analyzed. If the last two blocks were eliminated, due to the unusual factors just mentioned, the 9000 remaining commercial type store prescriptions would require only 34 more ingredients than the first 9000 professional store prescriptions.

There is more to this study than meets the eye, and it would be remiss not to state that of the 1274 ingredients that occurred in the 10,000 prescriptions filled in the commercial type stores, 17 per cent were chemicals, 46 per cent were galenicals and 37 per cent specialties. Chemicals were minor offenders and in the emergence of new ingredients shown in Table XXXIII, had a tendency to emerge in fewer numbers in each succeeding block than either galenicals or specialties. As a matter of fact it was not necessary to purchase any new chemicals at all in the 16th and 17th

(*Continued on page 894.*)

TABLE XXXIV.—SUMMARY OF THE PRESCRIPTION DEPARTMENT INVENTORY OF COMMERCIAL TYPE PHARMACY NO. 6-B.

Type of Ingredient.	Number of Items without Movement or Purchase.	Average Inventory Value.	Number of Items with Movement but No Purchase.	Average Inventory Value.	Number of Items with Purchase and Movement.	Average Inventory Value.	Number of Items Purchase and No Movement.	Average Inventory Value.	Number of Items with Movement and No Purchase (Discontinued).	Average Inventory Value.	Total Number of Items.	Total Average Inventory Value.
1. Chemicals	78	$ 20.76	46	$ 15.02	114	$ 48.53	10	$1.27	24	$ 4.32	272	$ 89.90
2. A—Crude Botanical Drugs	30	7.74	12	3.45	12	4.08	1	0.29	4	0.68	59	16.24
B—Powdered Botanical Drugs	10	1.74	3	1.28	4	0.64	0	0	0	0	17	3.66
Total Botanical Drugs	40	9.48	15	4.73	16	4.72	1	0.29	4	0.68	76	19.90
3. Galenical and Pharm. Preparations												
A—Liquids												
(1) Ampuls	2	1.30	0	0	3	1.91	0	0	1	0.42	6	3.63
(2) Waters	6	0.95	2	1.08	6	2.20	0	0	0	0	14	4.23
(3) Solutions and Liquors	6	1.72	6	1.97	6	2.84	0	0	3	0.96	21	7.49
(4) Emulsions, Mixtures, Milks, etc.	2	0.22	0	0	3	2.71	0	0	0	0	5	2.93
(5) Syrups, Mucilages, Glycerites and Honeys	10	6.37	5	3.40	8	4.39	0	0	3	0.88	26	15.04
(6) Elixirs	13	9.98	10	8.59	9	13.16	0	0	6	5.10	38	36.83
(7) Spirits	0	0	2	1.64	3	1.55	1	0.09	0	0	6	3.28
(8) Liniments	0	0	0	0	2	1.73	0	0	1	0.23	3	1.96
(9) Tinctures	10	6.87	7	4.17	18	12.57	2	0.26	4	1.71	41	25.58
(10) Fluidextracts	35	22.80	10	6.56	8	9.11	1	0.35	1	0.27	55	39.09
(11) Wines	1	1.40	2	1.40	0	0	0	0	0	0	3	2.80
(12) Lotions	1	0.35	0	0	0	0	0	0	1	0.08	2	0.43
Total Liquids	86	51.96	44	28.81	66	52.17	4	0.70	20	9.65	220	143.29
B—Solids												
(1) Pills	20	6.87	8	4.02	2	0.77	1	0.17	3	0.24	34	12.07
(2) Tablets	63	20.90	25	8.72	40	19.44	4	0.37	8	1.00	140	50.43
(3) Tablets—Dispensing	3	1.51	2	0.15	3	0.86	0	0	2	0.06	10	2.58
(4) Tablets—Hypodermic	29	6.40	9	3.71	9	3.96	3	0.88	4	0.34	54	15.29
(5) Capsules	2	5.65	1	3.94	7	5.10	1	0.42	5	0.99	16	16.10
(6) Effervescent Salts	1	0.48	0	0	0	0	0	0	0	0	1	0.48
(7) Ointments	6	1.52	6	2.22	12	5.39	0	0	7	0.83	31	9.96
(8) Powders	2	1.50	4	4.23	0	0	0	0	0	0	6	5.73
(9) Powdered Extracts	8	3.56	5	4.82	3	0.62	0	0	1	0.05	17	9.05
(10) Solid Extracts, Concentrations, Resinoids, Enzymes	4	1.15	3	0.57	1	0.76	0	0	0	0	8	2.48
Total Solids	138	49.54	63	32.38	77	36.90	9	1.84	30	3.51	317	124.17

Total Solids	138	49.54	63	32.38	77	36.90	9	1.84	30	3.51	317	124.17
C—Glandular Products												
(1) Ampuls	1	0.55	0	0	1	2.29	0	0	0	0	2	2.84
(2) Powders	3	3.57	1	0.40	4	6.25	0	0	0	0	8	10.22
(3) Tablets	1	1.33	1	1.41	10	10.12	0	0	1	0.94	13	13.80
Total Glandular Products	5	5.45	2	1.81	15	18.66	0	0	1	0.94	23	26.86
D—Biologicals	12	24.33	1	0.90	9	8.53	0	0	0	0	22	33.76
Total Galenical and Pharmaceutical Preparations	241	131.28	110	63.90	167	116.26	13	2.54	51	14.10	582	328.08
4. A—Oils, Expressed and Fixed	3	0.58	1	0.20	7	3.56	0	0	4	0.79	15	5.13
B—Oils, Volatile	14	3.90	6	2.85	7	2.18	2	0.45	1	0.04	30	9.42
Total Oils	17	4.48	7	3.05	14	5.74	2	0.45	5	0.83	45	14.55
5. Whiskey	0	0	0	0	4	52.04	0	0	0	0	4	52.04
6. Miscellaneous	9	2.95	6	1.18	9	2.02	1	0.03	7	0.69	32	6.87
7. Specialties												
A—Liquids												
(1) Ampuls	6	8.17	0	0	1	0.89	0	0	2	1.38	9	10.44
(2) Inhalants	2	1.70	0	0	8	17.52	0	0	0	0	10	19.22
(3) Elixirs	6	7.02	5	3.87	4	4.72	1	0.30	0	0	16	15.91
(4) Other Liquids	46	40.66	29	39.60	66	71.17	0	0	14	5.79	155	157.22
Total Liquids	60	57.55	34	43.47	79	94.30	1	0.30	16	7.17	190	202.79
B—Solids												
(1) Pills	4	2.33	0	0	4	4.21	0	0	0	0	8	6.54
(2) Tablets	30	22.78	14	10.14	70	49.60	4	0.96	6	1.95	124	85.43
(3) Capsules	3	3.93	2	3.08	12	10.11	1	0.51	1	0.60	19	18.23
(4) Effervescent Salts	2	1.17	1	0.43	6	7.47	0	0	0	0	9	9.07
(5) Ointments	5	5.05	4	4.11	3	1.49	2	0.70	3	0.38	17	11.73
(6) Powdered and Other Dry Specialties	16	14.50	9	6.83	18	13.65	2	0.59	1	0.20	46	35.77
(7) Suppositories	2	1.50	0	0	0	0	0	0	0	0	2	1.50
Total Solids	62	51.26	30	24.59	113	86.53	9	2.76	11	3.13	225	168.27
C—Glandular Products	6	5.80	3	4.97	14	15.21	0	0	2	0.32	25	26.30
Total Specialties	128	114.61	67	73.03	206	196.04	10	3.06	29	10.62	440	397.36
Grand Total	513	$283.56	251	$160.91	530	$425.35	37	$7.64	120	$31.24	1451	$908.70

(*Continued from page 891.*)

blocks, and only twenty new chemicals at an average value of $0.57 each for the 1500 prescriptions contained in the 18th, 19th and 20th blocks. On the other hand, it was necessary to purchase 62 new galenicals at an average cost of $0.88 each, and 61 new specialties at an average cost in excess of $1 each for the 2500 prescriptions contained in the last 5 blocks of prescriptions enumerated.

It might be mentioned that narcotic prescriptions were distributed proportionately through each group of 10,000 prescriptions, so that no block was distorted because of this type of prescription.

This study shows quite clearly the prescription department inventory problem of the pharmacist, whether he conducts a professional or commercial type drug store, as he must continually stock new ingredients, some of which may have little call. In addition to this, many items, particularly emergency items, must be stocked in anticipation of a rare call.

ACTUAL INVENTORY SUMMARY OF THE PRESCRIPTION DEPARTMENT OF A COMMERCIAL TYPE PHARMACY.

(*See Table XXXIV on pages 892 and 893.*)

At the time of the preparation of this manuscript the inventory analysis of one of the commercial type survey stores, No. 6-B, has been completed and a summary is inserted herewith in order to give the picture of the actual inventory problems of a drug store. Store 6-B is a well-managed, fairly modern store, and yet is faced, as are most druggists, with the problem of an over-crowded prescription department inventory containing many "dead" items. During the survey test year, from May 1, 1931 to May 1, 1932, Store 6-B filled a total of 4013 regular prescriptions with a sales volume of $3552.75 and 848 liquor prescriptions with a sales volume of $2332. The total sales volume of this prescription department was $7042.04, for in addition to the sales from regular and liquor prescriptions, non-prescription sales of bulk remedies brought in $284.44, sales of specialties amounted to $810.85, and sales of biologicals aggregated $62. Yet this prescription department would have shown a loss for the survey year had not the net profit on liquor overcome the loss realized on regular prescriptions.

As will be seen in the following table, there were 1451 different items in the prescription department inventory of Store 6-B. Yet it has been shown earlier in this chapter that only 1274 different ingredients were required in filling 10,000 prescriptions from commercial type drug stores, almost $2^1/_2$ times as many prescriptions as Store 6-B filled in a year. No wonder, then, that there were 513 items (35.4 per cent of the 1451 items stocked) which showed no movement at all or purchase from the supply source during the survey year. The same quantities of these 513 items were on the shelves at the end of the survey year as when inventoried at the beginning of the Survey. These items had undoubtedly been ordered to meet the demand of a prescription in an earlier year, for which there was little or no later call.

This analysis certainly gives a vivid actual picture of the problem mentioned earlier in the chapter where methods of simplifying inventory is discussed. This pharmacist's shelves are cluttered with many "dead" items as the result of many prescriptions calling for little used ingredients. Furthermore, the fact that the regular prescription business of this store showed a loss portrays the seriousness of this situation from a monetary standpoint.

In addition to the 513 "dead" items mentioned above, this pharmacist ordered 37 new ingredients when there was no prescription requiring that he do so. These 37 ingredients had no call and joined the rest of the "shelf-warmers." Of the 513 items with no movement and purchase, 78 valued at $20.76 were chemicals, 241 valued at $131.28 were galenicals and 128 worth $114.61 were specialties.

There is no need of writing elaborate text on this table as it is self-explanatory, and shows the results for the different types of ingredients quite in detail. It might be mentioned that there were 530 items which had both movement and purchase from the supply source. There were 371 other items which had movement, but which were not replenished during the Survey, and 120 of these items were discontinued. The total inventory, consisting of 1451 different items, was valued $908.70, an amount considerably greater than the amount suggested for a store's opening order elsewhere in the report, probably due to the accumulation of many items of infrequent occurrence.

Biologicals are seldom prescribed, so it is particularly interesting to note the extent of their movement. It should be kept in mind that these results are just for one particular store.

Preliminary inventory tabulations for Store 3-B show a much larger movement of biologicals in that store than in Store 6-B.

The information presented in this table should be studied in conjunction with the earlier table in Chapter III showing the average cost of ingredients and prices of prescriptions in Store 6-B, and with the lists of leading ingredients printed in Chapter VII.

CHAPTER VI. SIMPLIFICATION OF THE PRESCRIPTION DEPARTMENT INVENTORY.

Because of the large number of different ingredients required in filling prescriptions, such a large proportion of which merely become "shelf-warmers," it is certainly to the interest of the pharmacist to take steps to keep the number of items at as low a figure as possible, whenever this can be done without a violation of professional prerogatives and duty.

The first step in most drug stores should be to get rid of the large number of items which have long been on the shelves without call. This "housecleaning" would not include items of an emergency character which are kept in anticipation of a rare call, but would be aimed at obsolete manufacturers' specialties, numerous fluidextracts and galenicals and similar items which have fallen into disuse but which most druggists seem never to discard, reinventorying them year after year. These "shelf-warmers" might profitably be destroyed, exchanged or contributed to a charitable institution. Druggists might well emulate the policy of a nationally known pharmacist who has created what he styles the "morgue." This is a chest or cupboard in which he places at intervals items which have not been prescribed for a year. A loose leaf alphabetical list is kept of these items, so that he can immediately place his hands on one of these obsolete items if he should receive a call for it. At the same time, the shelves in his prescription room present an orderly, tidy and not crowded appearance, facilitating the rapid filling of prescriptions and decreasing the chances of inaccuracy. The adoption of this method by druggists throughout the country is recommended, and it is believed that the improved appearance of prescription rooms will favorably impress physicians, with a resulting increase in the prescription business of those stores which clean out their shelves in this way.

While from the theoretical point of view it would be a good thing for the pharmacist to turn down prescriptions containing a rare item which will probably not be called for again and which is destined to become a "shelf-warmer," many pharmacists would say that from the practical point of view this cannot be done; that customers do not understand the business reasons of the pharmacist in turning down such a prescription and that such a policy would undoubtedly hurt the reputation of the store.

Three methods of handling this problem suggest themselves, where the size of the town and the number of drug stores permit. The first method is for the pharmacist to accept all prescriptions calling for an ingredient of rare occurrence, but to have an arrangement with the drug store doing the biggest prescription business in the town, preferably a professional pharmacy, to fill such prescriptions for them and allow a discount. Another method would be for a group of pharmacists to appoint one of their number to handle the type of prescription under discussion, filling the more staple and emergency items themselves. The third method would be for a group of pharmacists to employ their own pharmacist, naturally the most expert possible, and share the expense of a centrally located store. This store would not need to be in a ground floor room, so the expense could be kept at a low figure. Any of the three methods would eliminate the trouble and expense incident to the attempt to fill prescriptions calling for rarely used ingredients, at the same time avoiding any risk of losing professional prestige and reputation by refusing to accept such prescriptions.

However, if a pharmacist is unable to adopt one of the methods suggested above and yet feels that he must do something to prevent the accumulation of many "dead" items on his shelves, about the only two courses open to him are to refuse to fill certain prescriptions and to contact his leading physicians with a view to obtaining their coöperation in the matter. But in selecting the type of prescription to be turned down, the pharmacist will find the number extremely limited due to various reasons. He will naturally want to eliminate only those items which occur very infrequently and are not of an emergency nature. But often an ingredient occurring just once is prescribed with other ingredients which are comparatively fast movers. If the druggist turns down this prescription in order to avoid purchasing a quantity of the unusual ingredient for which

he has had no previous call, he will also have to turn down a chance to use the faster-moving ingredients. Yet, it is quite possible that a large part of the supply of the unusual ingredient, even if ordered in the smallest quantity, will lie unused on the shelves.

Only in the case where the unusual ingredient is called for in a single-ingredient prescription does the problem become relatively more simple. If the prescription calls for only a part of the quantity which must be ordered, the pharmacist may turn it down to avoid adding this additional item to his stock of prescription ingredients. But even in this case, the pharmacist must consider whether or not he is refusing a service to a regular customer which might cost more than the saving accruing from the refusal to make this investment. He must also consider the fact that this prescription might be refilled one or more times, which would make it profitable in the end.

After all, it is hard to judge in advance whether or not the new ingredient will be called for just a single time. It might, for example, turn out to be an ingredient which a particular doctor, who sent considerable business to the store, had recently found to be applicable in treating certain cases, and thus this new ingredient might later be prescribed quite frequently by this particular physician. The pharmacist will always be willing to go to extra effort and expense to take care of the unusual demands of regular customers, both physicians and patients.

A sample of 1950 prescriptions from commercial type Store No. 4 were studied to give an actual example of the possibilities of elimination of prescription department items. The 1950 prescriptions required 604 different ingredients, of which 244, or 40.6 per cent, occurred only one time. Eliminating those ingredients which were called for in combination with a faster moving ingredient, it was found that 134 of the 244 ingredients which were prescribed just once each, were not prescribed in combination with other ingredients. The investment required in purchasing the usual quantity of each of these 134 ingredients was found to total $131.10. The table below gives a summary of the investigation of the 134 ingredients which occurred just one time each, and on single-ingredient prescriptions:

TABLE XXXV.

Type of Ingredient.	Number of Ingredients.	Per Cent of Total.	Total Investment Required.	Average Investment per Ingredient.
Chemicals	9	6.7	$ 4.84	$0.54
Galenicals	37	27.6	36.00	0.97
Specialties	88	65.7	90.26	1.03
Total	134	100.0	$131.10	$0.98

Thus it will be seen that a considerable investment is required in filling these 134 prescriptions which occurred just once among the 1700 prescriptions studied. While these 134 ingredients lend themselves best to any attempt to keep down the number of prescription department items, yet even with these ingredients there are many factors to be considered before refusing the prescription, as outlined above. Store 4 fills about 7900 prescriptions annually at an average price of $1. Thus the average investment in these "shelf-warmers" almost equals the average retail prescription price. It is striking to note that 244 "dead" items were called for in prescriptions which amounted to only about one-quarter of a year's prescription business.

Thus, while there are undoubtedly instances where a prescription calling for an ingredient of rare occurrence may well be turned down, yet this will not greatly reduce the number of prescription items required in filling prescriptions. However, any effort to keep the number of prescription items at a low figure, if exerted on a systematic and thoughtful basis, should be of assistance in the pharmacist's attempt to increase the profit possibilities of the prescription department.

It would seem that the most practical way to approach this problem would be to go to the source and obtain the coöperation of the physicians who write the prescriptions. It is believed that physicians are interested in decreasing the cost of medical care, and should be glad to cooperate with the druggist if they are individually and collectively made aware of their tendency to write for so many ingredients that are rarely prescribed, when another ingredient of more popular use would serve the same purpose.

As seen in the case of Store 4, the bulk of these "shelf-warmers" were manufacturers' specialties, which the physician probably had recently heard of, thought he'd try, written a prescription for and then promptly forgotten. If the physician realized the expense involved, he would probably be glad to eliminate this wasteful practice to a great extent, calling for rare ingredients only when there was a real necessity that they be prescribed.

The pharmacists' associations could get in touch with physicians' associations in bringing this suggested reform to the attention of physicians collectively. However, the individual pharmacist can also take steps by contacting his leading physicians. Chapter IV showed that a major share of the total prescription business of most stores consists of prescriptions written by just a few physicians. In professional Store A, the leading 25 (out of 463) physicians wrote 56.4 per cent of the prescriptions studied, while in professional Store B, 25 (out of 259) physicians wrote 65.8 per cent of the prescriptions studied. The same situation was found to exist in the commercial type drug stores, as reported in the first prescription department report from this survey. Thus, the pharmacist should be able to accomplish a great deal in his effort to simplify the prescription department inventory, by maintaining closer contact and coöperation with his leading doctors. Through this contact, the pharmacist can also determine the physician's preferences and be ready to supply whatever he prescribes. This should be particularly helpful in the selection of the brands to be carried. Besides cutting down the call for "new" ingredients, the pharmacist would also be better informed as to the extent to which a "new" ingredient, if called for, would be used in the future. (See the latter part of this chapter, wherein is suggested a method by which the pharmacist may be kept informed of new manufacturers' specialties as they are put on the market.)

Pharmacists generally take inventory at considerable expense each year for tax purposes, and then file away the inventory list and forget about it. The inventory list could be put to practical use by checking it against the previous year's list to weed out "dead" items which have shown no movement during the year.

It has just been seen above that 65.7 per cent of the 134 prescription items occurring just once were manufacturers' specialties. The largest part of the many items on the pharmacists' prescription shelves are specialties, many of which are prescribed just once or a few times. The average number of times that each specialty ingredient is prescribed in 20,000 prescriptions, as reported in Table XXVIII is 12.8, while chemical ingredients were called for an average of 80.8 times each. In filling the 20,000 prescriptions, 745 different specialty ingredients were prescribed, but only 280 different chemical ingredients were called for. Manufacturers interested in the welfare of the pharmacist should mutually take cognizance of this condition, and while naturally continuing to market any new product possessing originality and being an actual contribution to the existing therapeutic agents, should endeavor to resist the temptation of duplicating the already too extensive number of medicinal products now available.

The questionnaire stores with their average inventory investment of $9255 reported in all but four instances that they did not frequently receive prescriptions calling for items not stocked. All of these stores reported that the items not in stock were new manufacturers' specialties.

INTRODUCTION OF NEW MANUFACTURERS' SPECIALTIES.

Throughout this text reference has been made to the large number of specialties on the market and being placed on the market each year. The major portion of the pharmacist's inventory problem in the prescription department has been shown to be due to many specialties which are prescribed just once, or a very few times, in the course of a year. It is certainly of interest to know to what extent these new remedies are introduced each year. Therefore, a study was made of the recent remedies reported in the "Annual Recapitulation of Recent Remedies" in *The American Druggist*, October issues of 1928, 1929, 1930 and 1931. It is possible that there were some new specialties which were not included in the tabulations of *The American Druggist*, but at least the number shown is not an overstatement of the situation.

It was found that during the four years mentioned, 495 new remedies were introduced. The 495 new specialties were divided as follows among the different years: 1928, 103 new remedies; 1929, 126 remedies; 1930, 134 remedies; 1931, 122 remedies; and 10 new products which were put on the market during the period, but as to which the exact year is unknown.

In some cases a remedy was put out in more than one form, such as, for example, liquid and powder. If each form is considered as a different new remedy, there were 566 new remedies introduced during the four-year period. Throughout the remainder of this section, the number of new remedies will be considered as 566, each form of a new remedy being considered as an additional item.

It was only possible to determine the name of the manufacturer in 520 of the 566 cases. However, these 520 new remedies were introduced by a total of 158 different manufacturers. In 40 of the cases where the manufacturer was unknown, it was at least possible to determine the firms which marketed the products. These 40 new remedies were marketed by 27 different firms. In the other 6 cases it was not possible to determine either the manufacturer or the firm which marketed the product.

It was found that a small number of manufacturers was responsible for a large proportion of the new remedies introduced. Of the 158 known manufacturers, 22 introduced 7 or more new remedies each during the four-year period, 2 manufacturers introducing as many as 36 new products each. In all, these 22 manufacturers introduced 306 new products, or 54.1 per cent of the 566 new remedies put on the market. Of the 22 manufacturers which led in the introduction of new products, 6 were foreign firms and 16 were domestic corporations. Most of the 22 manufacturers are among the best-known pharmaceutical manufacturers.

The table below shows the form of the 566 new remedies. This is interesting in determining whether or not the liquid form is being replaced in part by other forms, such as tablets and capsules. The section in this report which shows the form of the 8670 professional store prescriptions filled in 1930 shows that 52.65 per cent of those prescriptions were liquids, whereas in 1910 and 1920 liquids represented about 64 per cent of the prescriptions studied. However, in approximately 24,000 prescriptions filled by commercial type drug stores in 1930, 61.3 per cent were liquids. Tablets showed a steady increase from 5.9 per cent in 1910 to 13.5 per cent in 1930 in the professional store prescriptions. It is interesting to note, therefore, that only 30.4 per cent of the recently introduced products were liquids, while 21 per cent were tablets. There was only 1 ampul prescription among the 8670 professional store prescriptions studied, and yet 71 of the new remedies were in ampul form. Only 5 per cent of the new specialties were capsules.

Of course, the introduction of new remedies does not necessarily mean that they will enjoy a large sale. Therefore, the fact that these 566 new remedies have a much smaller proportion of liquids and larger proportion of tablets does not necessarily indicate that the proportion of liquids in prescriptions will be greatly reduced. But it does give a definite picture of the trend as far as the introduction of new specialties is concerned. In line with this thought it is interesting to see the extent to which these new remedies are adopted by physicians. In approximately 35,000 prescriptions filled by professional and commercial type pharmacies in St. Louis, Mo., during the 12-month period from May 1, 1930 to May 1, 1931, only 22 (17.5 per cent) of the 126 new remedies marketed in 1929 appeared at all. Of the 134 new remedies introduced in 1930, only 17 (12.7 per cent) were prescribed in the 35,000 prescriptions. Of the 122 new specialties marketed in 1931, only 12 (9.8 per cent) appeared in the prescriptions studied. If the St. Louis situation can be said to be typical of the whole United States, we can then assume that on an average only 13.4 per cent of the new proprietaries being marketed are prescribed to any extent.

It should be mentioned, however, that new specialties are more likely to be found on the shelves of the professional pharmacy than in the commercial type drug store. Proprietors of three professional pharmacies in St. Louis were each asked to give a list of their leading specialties. Thus a list of 43 specialties was obtained, all of which were prominent in at least one professional store. The inventories of 11 commercial type stores were then examined and it was found that 24 of the 43 specialties did not appear in any of the 11 stores, while 8 specialties appeared in only 1 store each. Only 4 of the 43 specialties appeared in more than 4 of the 11 commercial type drug stores, and none of them appeared in all 11 stores. The manufacturer must, therefore, depend on the professional pharmacy to a large extent when marketing a new product. Nearly three-fourths of the 35,000 prescriptions examined to find the occurrence of the 566 new remedies were filled in commercial type drug stores. Had prescriptions from professional pharmacies only been searched, a more favorable showing for the 566 new remedies might have re-

sulted. However, the prescriptions examined did include several thousand prescriptions from professional stores.

In view of the above showing it might again be said that manufacturers who have the interests of the pharmacist at heart and who wish to reduce where possible the cost of medical care, have a real opportunity to be of practical assistance by refraining from introducing new specialties which merely duplicate the remedies already on the market and which are not an actual contribution to the existing therapeutic agents.

TABLE XXXVI.—FORM OF NEW MANUFACTURERS' SPECIALTIES INTRODUCED IN 1928, 1929, 1930 AND 1931.

Form of Remedy.	Number of New Remedies.	Per Cent of Total.
Liquids (Including Solutions)	172	30.4
Tablets	119	21.0
Powders	76	13.4
Ampuls	71	12.6
Creams, Jelly, Salve or Ointment	41	7.2
Pills, Pearls, etc.	33	5.8
Capsules	28	5.0
Unknown	26	4.6
Total	566	100.0

SPECIALTY CAPSULE PRESCRIPTIONS.

It is interesting to see what percentage of the capsule prescriptions studied were manufacturers' specialties. Out of a total of 1258 nonnarcotic capsule prescriptions filled in professional Stores A and B, 167 or 13.3 per cent were manufacturers' specialties. Both stores were quite close to this average percentage. In Store A, 12.2 per cent of the nonnarcotic capsule prescriptions were specialties, while this was true of 14.9 per cent of Store B's nonnarcotic capsule prescriptions. Store A filled 768 nonnarcotic capsule prescriptions and Store B only 490. This finding comes as a surprise, particularly in view of the showing in the preceding table to the effect that only 5 per cent of the new specialties introduced in the four years from 1928 through 1932 were capsules.

METHOD OF FILING INFORMATION ON SPECIALTIES.

The conduct of the prescription phase of the survey has brought to light a condition which the specialty manufacturer will probably appreciate being brought to his attention, and that is the scarcity of convenient information and reference to the numerous existing specialties. This inconvenience is not felt so much by the professional pharmacies which have a large enough turnover in the items to be familiar with them, but it is a decided problem to the majority of the 60,000 retail pharmacists who while only filling around 10 prescriptions a day each, nevertheless feel called upon to have at their finger tips for themselves and physician patrons detailed information regarding the name, price, form or forms, active ingredients and therapeutic action of the manufacturer's specialty.

It is true that some manufacturers announce the introduction of any new product in trade journals or their individual house organs, but with the multiplicity of tasks which confront the average pharmacist he does not always have time to scan and file this material. Furthermore, there is no uniformity in size of this literature, nor does he often receive a prescription calling for a specialty simultaneous with the receipt of its announcement in a house organ or a trade journal. It might be argued that upon the receipt of a prescription calling for a specialty with which he is not familiar, the pharmacist can run through his literature and see if he could not locate it. Obviously, this is not expedient. Or it might be suggested that he consult one of the trade directories with which he is furnished when he subscribes to a trade journal. Many reasons might be stated why this is often not productive of results. One such reason, and an important one from the manufacturers' viewpoint, is that even if he succeeded in locating the specialty in a trade journal, the information would give him only the price, the name of the product and the

name of the manufacturer, but would fail to give him any information regarding its form or forms, its composition and its therapeutic effect, and not infrequently the druggist is asked these very questions by a physician. He is thus placed in an unfavorable light in the eyes of the physician, or perhaps the physician writes a prescription for another ingredient which the pharmacist has readily available, in which case all the time and expense to which the manufacturer has gone in detailing the physician is lost.

Proprietors of drug stores interviewed during the conduct of the survey suggested that both manufacturers and pharmacists would mutually benefit, if all of the pharmaceutical specialty manufacturers would join in designing a uniform size card, approximately the size of a post-card or smaller, upon which would be printed the essential details regarding any new trade-named specialty which they contemplated introducing. The method for distributing this card to the pharmacist could be through several mediums, such as, for example, in an envelope under one cent postage or through one of the national retail druggist associations, such as the AMERICAN PHARMACEUTICAL ASSOCIATION or the National Association of Retail Druggists, or through the medium of the wholesaler. Numerous other methods will suggest themselves. The entertainment of the suggestion should include a consideration of a suitable case or box into which the cards could be filed. It is not believed that the expense of such an undertaking would be disproportionate to the benefit to be derived by all concerned, and it would seem to coördinate with the manufacturer's detailing programs.

This suggestion was first made by one of the authors of this report in an address before the American Pharmaceutical Manufacturers' Association at Greensboro, N. C., on May 17, 1932, shortly after the first report on the prescription phase of the National Drug Store Survey was published. It is gratifying to learn that one of the trade journals has endorsed the suggestion, and is going even further by making a practical application of the plan. Each month the *Druggists Circular* publishes full information concerning new manufacturers' specialties which have just been introduced. This information is published in convenient form, so that it can be clipped and pasted on 3″ by 5″ index cards, and placed in a file box for instant reference. The *Druggsists Circular* reports a hearty response to the plan as indicated by letters from pharmacists located in all sections of the country.

Since the inauguration of this information system, the *Druggists Circular* has described 63 of the newer trade-marked pharmaceutical specialties, only 2 of which are found among the 253 leading specialties described in the ingredient analysis of 20,000 prescriptions, presented later in this report. The fact that such a large number of new specialties have been introduced in such a short time shows the need for such information. If the publishers of this information would go a step further and publish a list of from 200 to 300 new specialties introduced in the last several years, such as those mentioned in another section of this report, they can give their readers even greater service.

The pharmacist's references at present include such textbooks and books of standards as the United States Pharmacopœia, the National Formulary, New and Nonofficial Remedies and a dispensatory. The execution of the plan outlined above would fill the gap and complete the sources of information to which the pharmacist could refer when seeking information regarding a prescription ingredient.

SPECIFICATION OF GALENICALS OF PARTICULAR MANUFACTURE.

As seen in Table XXVIII, 436 different galenicals used in filling 10,000 prescriptions in professional drug stores were used a total of 5455 times. In only 327 out of the 5455 times that galenicals were called for, or about 1 out of each 17 times, was a particular manufacturer specified by the prescribing physician. Prescriptions filled by Store A had 171 such specifications, and Store B, 156.

Galenicals, as used in this report, may be defined as preparations such as elixirs, fluidextracts, tablet triturates, certain organotherapeutics, concentrates, products in extract or other form, etc., which are of a competitive character, and which do not have distinctive trade names which would identify them as the exclusive product of a specific manufacturer.

The fact that there is so little specification of particular brands will be welcomed by the wholesaler and retailer who are interested in stock simplification and in keeping down to a minimum the investment in the prescription department inventory. On the other hand, it will not

be so cheerfully received by pharmaceutical manufacturers who are devoting considerable money and effort to have physicians specify their brand name when prescribing galenicals. One of the complaints most frequently voiced by pharmacists during the survey was the fact that brand specification of galenicals required them to carry from three to five brands of the same galenical such as Viosterol and Haliver Oil, detracting from the profit possibilities of the prescription department.

EXTENT OF MANUFACTURING IN THE PHARMACY.

Inquiry in the four professional pharmacies disclosed the fact that a considerable amount of manufacturing of galenicals and other preparations takes place in the professional pharmacy. Eight registered graduates are employed at Store A, and one of these has charge of the manufacturing, which requires about half his time as prescription clerk. This prescription clerk is paid the highest salary. Separate space is set aside for the manufacturing function. Inasmuch as all of the clerks are necessary, and no relief clerks are required, the proprietor estimates a saving of 20 per cent on preparations manufactured. Among the principal items manufactured in the store are Camphorated Tincture Opium, Elixir Iron Quinine and Strychnine, Spirit of Camphor, Compound Elixir Glycerophosphates, Syrup Ferrous Iron, Ointment of Rose Water, and all simple U. S. P. and N. F. preparations.

In Store B about the same situation exists. This store employs six registered graduates, one of whom does all of the manufacturing, which consumes about half of his time. The items manufactured are similar to those in Store A, and the estimated savings about the same as in Store A.

In Store C about 50 per cent of the galenicals and other such preparations are manufactured in the store. This work is assigned to a particular clerk, and requires from two to three hours of his time daily. The saving due to this store's manufacturing is estimated at 25 per cent. Among the leading preparations so manufactured in this store are Elixir of Terpin Hydrate, Elixir of Three Bromides, Compound Elixir of Glycerophosphates, Syrup of Hypophosphites, Syrup of Calcium Lactophosphate, Elixir of Ammonium Valerate, Syrup of Ferrous Iodide and Solution of Iron Peptonate and Managanese.

In Store D all galenicals are manufactured when practical, but if they require an assay, or if for some other such reason it is not practical to manufacture them, they are not manufactured in the store. This manufacturing is assigned to one clerk, and requires about 50 per cent of his time. The proprietor considers the time profitably spent, but has never estimated the savings. Among the leading preparations so manufactured in Store D are Antiseptic Solution, Tincture of Iodine, Lugol's Solution, Elixir Phenobarbital, Compound Syrup of Hypophosphites, Syrup Ferrous Iodide, Syrup of Tolu and Syrup of Wild Cherry.

All but two of the questionnaire stores manufactured galenicals and other preparations as much as possible, and this manufacturing was believed to be profitable in all but four of the cases.

(*To be concluded in October issue of the* JOURNAL)

ANOTHER TRI-STATE ASSOCIATION MEETING PLANNED.

The Pharmaceutical Associations of Arizona, New Mexico and West Texas held a joint meeting at El Paso in May of 1932 and had such a good time that they are planning to repeat the experience in 1935. Emissaries of El Paso came to the Carlsbad meeting of the New Mexico Association and extended an invitation, which was accepted, contingent upon similar acceptance by the Arizona and West Texas associations. Jack Robinson and L. Evans, Jr., both of Phoenix, Ariz., were present and expressed their belief that their state would be enthusiastic over the idea, and it is a foregone conclusion that West Texas will get behind the movement. It is hoped not only to get the druggists of these states together, but also to secure attendance from other states in the great West, including Colorado, Kansas and Oklahoma.—*Rocky Mountain Druggist.*

Chininum.—The Bureau for Promoting the Use of Quinine has published a booklet on "Quinine in General Medical Practice." It is a supplement, in a way, to the volume published in 1930 and edited by Dr. Fritz Johannessohn. Accompanying the volume is a smaller booklet on *Formulas* in which quinine is represented.

ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1932–1933.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 11.

August 28, 1933.

To the Members of the Council:

The Second Meeting of the Council for 1932–1933 was held in the Hotel Loraine, Madison, Wisconsin, on Monday, August 28, 1933, beginning at 9:30 A.M., with the following members present: Hilton, Arny, Bradley, Day, Caspari, Philip, Slocum, Eberle, DuMez and Kelly.

80. Committee on Finance. The following report was read by Chairman Bradley:

"With such competent and devoted financial officers as Secretary Kelly and Treasurer Holton, the work of the Committee on Finance is not arduous, but it is responsible and requires considerable attention by the chairman. The routine inspection of all bills, before they are paid, must be attended to, and the preparation of the annual financial budget requires careful study and considerable work. This was especially important this year, because of the reduced income due to the depression, when so many other organizations are involved in serious financial difficulties. Such difficulties constitute a conclusive test of the soundness of the policies and operation of an organization, and it is a pleasure to report that our ASSOCIATION is showing its soundness in the fine way it is weathering the storm.

"After paying careful attention to the finances of the ASSOCIATION for several years, we believe the ASSOCIATION to be in an entirely sound condition. Detailed information on financial matters is not given here as it is contained in the carefully prepared and audited reports of the secretary and the treasurer, presented at this meeting and at the end of the calendar year. The Committee on Finance has been doing its best to help the officers to keep the expenditures within the receipts, and we believe this will be accomplished."

After a general discussion of the finances of the ASSOCIATION, the report was accepted on motion of Day, seconded by Arny and carried.

81. Committee on Property and Funds. Chairman Philip read the following report:

"In accordance with Article VI of Chapter IV of the By-Laws of the Council, the Committee on Property and Funds submits its report. The Committee recommends to the Council the following banks and safe deposit vaults:

DEPOSITORIES FOR FUNDS.

The Baltimore Trust Company, Baltimore, Md.
The Baltimore National Bank, Baltimore, Md.
The Maryland Trust Company, Baltimore, Md.
The Merchants and Newark Trust Company, Newark, N. J.
The Boston Penny Savings Bank, Boston, Mass.

DEPOSITORIES FOR SECURITIES AND RECORDS.

The Baltimore National Bank, Baltimore, Md.—Safe Deposit Boxes.
The Maryland Trust Company, Baltimore, Md.—Safe Deposit Boxes.
The Merchants and Newark Trust Co., Newark, N. J.—Safe Deposit Boxes.

"The Committee is pleased to report that interest has been paid on all securities owned by the ASSOCIATION, with one exception. Interest on a $1000 bond of the City of Detroit, owned by the Life Membership Fund, and amounting to $40.00 has not been paid and no information is available just now as to when interest will be paid.

"The $275,000 U. S. Treasury bonds, 3%, owned by the Headquarters Building Fund, advanced in value to 98½ at which price they were sold in accordance with the best advice that the officers could obtain. As they were bought at par, this sale represented a loss of $4125 which

loss was more than made up by the savings on the building and interest saved on the bills for the building work and supplies.

"The treasurer is keeping a strict account of all investments for the Headquarters Building and property. The amount to June 30, 1933, was $422,624.19.

"No action has been taken with respect to the Franklin M. Apple Fund referred to in the report of the Committee last year and which amounts to $1607.05. The chairman of the Council, the secretary and the treasurer were appointed a committee to consider the most appropriate means of recognizing the generosity of Mr. Apple and his splendid support of the ASSOCIATION, and the final disposition of the fund. Until the Headquarters Building is nearer completion the committee can make no recommendation to the Council.

"As the treasurer will report, the Merchants and Newark Trust Company and the Boston Penny Savings Bank, in which the checking and savings accounts of the ASSOCIATION are kept, and the Maryland Trust Company, in which the Headquarters Building funds are deposited, opened on a full basis after the bank holiday. The Baltimore Trust Company, in which the secretary's account and the cash balances of the various funds are deposited, opened on a restricted basis and has since been reorganized as the Baltimore National Bank. How fully and rapidly the accounts will be paid by liquidation cannot be predicted. No other course than to coöperate is possible and in the meantime the balances draw interest at 2%.

"On the whole, the ASSOCIATION has come through the year very satisfactorily so far as its property and funds are concerned, and no changes are recommended."

On motion of Day, seconded by Caspari and carried, the report was received and the recommendation approved.

82. Standard Program. Chairman Hilton made a verbal report for the Committee, explaining the principal modifications made in the program of the 81st meeting. The report was received.

83. Committee on Recipe Book. In the absence of Chairman Lascoff the following report was read by the secretary:

"Your Chairman begs to submit the following report on the Recipe Book for the year 1932–1933.

"During the past year circulars were distributed. As per the report of Dr. Kelly, up to June 1, 1933, 93 books were distributed complimentary, 4487 have been sold and 420 are in stock. Since June 1st, your chairman has received several requests for books and orders have been filled by Lippincott and Company.

"The Committee is very anxious to revise this AMERICAN PHARMACEUTICAL ASSOCIATION Recipe Book and to have the second edition in print. However, this cannot be done until the N. F. is completed.

"In this connection, may I state that five bulletins have already been sent out to the members of the Committee.

"On March 16th, Bulletin Number 1 was sent out.

"Up to the present writing twenty replies have been received from the twenty-four members of the Committee.

"On the date of July 26, 1933, I received a letter from Dr. Gathercoal, chairman of the National Formulary Committee, accompanied by a list of deletions, and tentative deletions. The letter reads, in part, as follows:

> 'There is also inclosed pages 794–819 of the N. F. Bulletin showing the copy practically complete for the chapter which will be found in the N. F. on Diagnostic Reagents and Clinical Tests. You will note that this contains a good many formulas for staining solutions. I think all of these will be included in the N. F. and I trust that you will be careful not to duplicate them in the Recipe Book. There is also included a single page, 873, showing the Dental Preparations that have been approved for admission to the N. F. VI and those that have been refused admission to N. F. VI from N. F. V. These should not be duplicated in the Recipe Book.
>
> 'I think your plan for the several bulletins to the Recipe Book Committee is a very good one and the features that you mention should make the Recipe Book more popular.

'I forgot to state that quite a good many ampuls have been admitted to N. F. VI. A list of these is inclosed, pages 25–26 of Sub-Committee No. 8. I trust that you will not duplicate these titles in the Recipe Book.'

"Permit me to state, that all precautions will be taken that no items which will appear in the National Formulary will be in the Second Edition of the Recipe Book.

"The list of deletions follows:

Acet. Arom.
Cerat. Camph.
Chart. Pot. Nit.
Collod. Bitum. Sulphon.
Confect. Ros.
Confect. Senn.
Elix. Casc. Sagr. Co.
Elix. Cathart Co.
Elix. Chlorid.
Elix. Cinchon. Ferr. et Bism.
Elix. Cinchon. Ferr. et Strych.
Elix. Cinchon. Ferr. Bism. et Strych.
Elix. Coryd. Co.
Elix. Gent. et Ferr. Phos.
Elix. Guar.
Elix. Hydrast. Co.
Elix. Manac. Co.
Elix. Phosphor. et Nuc. Vom.
Emp. Fusc. Camph.
Emp. Sapon.
Emuls. Ol. Ricin.
Ext. Conii
Ext. Euonymi
Ext. Ferr. Pomat.
Ext. Hæmatox.
Ext. Ignat.
Ext. Kramer.
Fldext. Angel. Rad.
Fldext. Aral.
Fldext. Asclep.
Fldext. Aven. Sativ.
Fldext. Baptis.
Fldext. Boldi
Fldext. Chimaph.
Fldext. Chirat.
Fldext. Cocillan
Fldext. Coffeæ
Fldext. Copt.
Fldext. Corni
Fldext. Corydal.
Fldext. Cypriped.
Fldext. Digit.
Fldext. Droser.
Fldext. Dulcam.
Fldext. Fuci
Fldext. Galeg.
Fldext. Geran.
Fldext. Irid. Vers.
Fldext. Jugland.
Fldext. Kav.
Fldext. Kol.
Fldext. Lupulin.
Fldext. Manac.
Fldext. Matic.
Fldext. Mezer.
Fldext. Pareir.
Fldext. Querc.
Fldext. Rubi
Fldext. Rumic.
Fldext. Scopar
Fldext. Scutellar.
Fldext. Senecion.
Fldext. Solan.
Fldext. Thuj.
Fldext. Tong.
Fldext. Verbasc. Fol.
Fldglycer. Casc. Sagr.
Fldglycer. Glycyrrhiz.
Fldglycer. Kramer.
Fldglycer. Rhei
Garg. Guaiac. Co.
Glycer. Pic. Pin.
Glycerogel. Acid. Salicyl.
Glycerogel. Iodof.
Glycerogel. Zinc. Dur.
Glycerogel. Zinc. Mol.
Gossyp. Stypt.
Inf. Brayer.
Inf. Ros. Co.
Inunct. Menthol.
Lac. Ferment.
Lin. Opii. Co.
Liq. Aur. Brom. et Arsen
Liq. Bism.
Liq. Chlor. Co.
Liq. Ferr. Albumin.
Liq. Ferr. Cit.
Liq. Ferr. Salicyl.
Liq. Hydrastin. Co.
Liq. Iodi Phenol.
Liq. Pancreat.
Liq. Pepsin.
Liq. Pepsin. Antisept.
Liq. Pepsin. Arom.
Liq. Phos. Acid
Liq. Phos. Co.
Liq. Phosphor.
Liq. Sod. Arsenat.

Liq. Sod. Arsenat. Dil.
Lot. Ammon. Camph.
Mass. Copaib.
Mel Ros. et Sod. Bor.
Mel Sod. Bor.
Mist. Adstring.
Mist. Chlorof. et Morph Co.
Mist. Copaib. et Opii
Mist. Mag. Asafoet. et Opii
Mist. Ol.-Balsam.
Mist. Opii et Chlorof. Co.
Mist. Opii et Rhei Co.
Mucil. Sassaf. Medul.
Mull. Ac. Salicyl.
Mull. Creosot. Salicyl.
Mull. Hydrarg. Chlor. Corros.
Mull. Zinc.
Nebul. Thymol.
Ol. Inf.
Oleat. Quin.
Oleat. Veratrin.
Ol. Hyoscy. Co.
Oxymel Scill.
Past. Betanaphth.
Past. Dextrin.
Past. Zinc. Sulphur.
Petroxolina Medicata
Petrox. Betanaphth.
Petrox. Bitum. Sulphon.
Petrox. Cadinum
Petrox. Chlorof. Camph.
Petrox. Eucalyptol.
Petrox. Guaiacol.
Petrox. Hydrarg.
Petrox. Iodi Dil.
Petrox. Menthol.
Petrox. Methyl. Salicyl.
Petrox. Phenol.
Petrox. Phenol. Camph.
Petrox. Sulphurat.
Petrox. Sulphurat. Co.
Pil. Aloe. et Ferr.
Pil. Aloe. et Podoph. Co
Pil. Aloe. Hydrarg. et Podoph.
Pil. Antiperiod. s. Aloe
Pil. Fer. Quin. Aloe et Nuc. Vom.
Pil. Opii. Digit. et Quin.
Pil. Opii et Camph.
Pulv. Aloe et Canell.
Pulv. Antimon.
Pulv. Arom. Rubefac.
Pulv. Cret. et Opii Arom.
Pulv. Hydrarg. Chlor. Mit. et Jalap.
Pulv. Myric. Co.
Pulv. Rhei et Magnes. Anis
Pulv. Talc. Co.
Sevum Benz.
Spec. Emoll.
Spec. Lax.
Spec. Pect.
Spec. Sinap.
Stil. Medic.
Stil. Acid Salicyl.
Sulphur. Iod.
Syr. Allii
Syr. Calc. Iodid.
Syr. Calc. Lactophos. et Ferr.
Syr. Ferr. Sacch. Sol.
Syr. Ficor. Co.
Syr. Iodotan.
Syr. Kramer.
Syr. Mann.
Syr. Phos. Co.
Syr. Phos. Quin. et Strych.
Syr. Quinid.
Syr. Rham. Cathart.
Syr. Ros.
Syr. Rubi
Tr. Amar.
Tr. Antiperiod. s. Aloe.
Tr. Aromatica
Tr. Croc.
Tr. Ferr. Chlor. Aeth.
Tr. Ferri Pomat.
Tr. Guaiac. Co.
Tr. Humul.
Tr. Ignat.
Tr. Jalap Co.
Tr. Opii Crocat.
Tr. Opii et Gambir Co.
Tr. Passiflor.
Tr. Rhei Aq.
Tr. Rhei et Gent.
Tr. Sabal et Santal
Tr. Sumbul
Troch. Eucalypt. Gum.
Ung. Fusc.
Ung. Plumb. Iod.
Ung. Veratrin.

"As stated before, on March 16th, I sent out Bulletin Number 1 with a list of 60 Pharmaceutical Formulas.

"On August 10th, the following Bulletins were mailed to the Members of the Committee:

Bulletin Number 2: Consists of 16 Pharmaceutical Formulas.
Bulletin Number 3: Consists of 15 Formulas for Stains and Reagents.

Bulletin Number 4: Consists of a Table of Doses.
Bulletin Number 7: Consists of 11 Dental Formulas.
Bulletin Number 8: Consists of a Questionnaire.

"A total of 102 Formulas was submitted for consideration besides a Questionnaire and proposed Table of Doses. Although many pharmacists are in constant need of this Table of Doses, I do not think that it will be adopted.

"Quite a number of the foregoing will appear in our Second Edition. However, I am not in favor of permitting the Fluidextracts and Fluidglycerites in the new book. Very few pharmacists prepare their own Fluidextracts or Fluidglycerites.

"Many comments, suggestions and criticisms have been received to date. These will be taken up in their order and duly considered before a final vote is taken on any preparation in question.

"On August 1st, I received a letter from Dr. Cook asking whether an exhibit of about 30 or more of the most important preparations from the Recipe Book, for which there is a large use in this country at this time, could be prepared in time for this Convention. He also requested that a short paper be prepared for the Thursday afternoon session devoted to exhibits. This has been done.

"The idea of the exhibit is, of course, to give prominence to the Book along with the U. S. P. and N. F. Not enough publicity has been given to the Recipe Book. There are many physicians who do prescribe from the U. S. P. and N. F. They prescribe very little from the Recipe Book for the simple reason that they are not sufficiently acquainted with it because, as I have said before, not enough publicity has been given.

"I am taking this opportunity to thank the members of the Committee for their different suggestions and criticisms.

"I wish to thank Dr. Kelly and Editor Eberle for their work in connection with the distribution and sale of the Pamphlets and Books. Work on the next Revision is being done very carefully and especial care taken not to repeat the small errors which are wont to crop up.

"I also wish to thank once more all of the members of the AMERICAN PHARMACEUTICAL ASSOCIATION who have shown their interest and coöperation in our work in behalf of the AMERICAN PHARMACEUTICAL ASSOCIATION Recipe Book."

The report was accepted on motion of Day, seconded by Arny and carried, with thanks and with the suggestion that the proposed table of doses might be included in the index of the second edition.

84. Committee on National Formulary. Chairman Gathercoal read the following report:

REPORT OF THE NATIONAL FORMULARY COMMITTEE.

BY E. N. GATHERCOAL, CHAIRMAN.

The National Formulary Committee has vigorously prosecuted the work of the Revision during the past year. From August 20, 1932 to a similar date in 1933 there have been issued from the Chairman's office 540 mimeographed pages of the N. F. Bulletin (pages 566–1082 and Index) and approximately 360 mimeographed pages in the several Sub-Committee Letters. A relatively large correspondence has also been carried on during the year.

ADMISSIONS TO NATIONAL FORMULARY VI.

The following tabulation shows the admissions to N. F. VI as of August 15, 1933. There is almost constant change going on as regards admissions and it is difficult to obtain figures that are truly accurate. It will probably be next summer before final results can be published.

The trend of admissions to N. F. VI can now be plainly discerned. This trend is to refuse admission to items not being prescribed by physicians and to admit from N. F. V and from deleted U. S. P. X items and particularly from new items, only those that are prescribed by physicians. This is illustrated by the fact that of the 305 items in N. F. V not admitted to N. F. VI, 221 have no prescription usage and only 15 have occurrences of more than 1 per 10,000 prescriptions. Many of these 15 are being reconsidered for admission to N. F. VI.

It is true that we will have in N. F. VI quite a good many "pharmaceutical necessities,"

i. e., items required for N. F. preparations, but in themselves are never directly prescribed. This includes many of the crude drugs, some chemicals and many of the fluidextracts. Likewise, there will be present in N. F. VI quite a number of items, perhaps thirty or forty, that are extensively used by physicians, but that are rarely prescribed by physicians. This includes particularly the ampuls and possibly some biologicals. Finally there is a relatively small group of items that are extensively sold as medicines, but are rather seldom prescribed. This includes such items as Psyllium Seed, Matricaria, Areca, Salicylic Collodion (corn cure), Dentifrice.

IN NATIONAL FORMULARY V.

	Items.	Occurrences per 10,000 Prescriptions.
Part I	565	1519.6
Part II	214	130.0
Total	779	1649.6

IN NATIONAL FORMULARY VI.

N. F. V items admitted to N. F. VI	472		1587.5	
U. S. P. X items admitted to N. F. VI	73		281.6	
Unofficial items admitted to N. F. VI	96		838.4	
N. F. V items proposed for N. F. VI		18		43.6
Unofficial items proposed for N. F. VI		158		1020.7
Total	641		2707.5	

N. F. V ITEMS NOT ADMITTED TO N. F. VI.

Part I, 222 items with 40.8 occurrences
Part II, 83 items with 21.3 occurrences
Total, 305 with 62.1 occurrences.

It will be of interest to those who are not fully familiar with the details of the National Formulary Committee procedure, to know that the entire N. F. Committee serves as the Committee on Scope. All of the items that have been proposed for admission to N. F. VI up to August 1, 1933 have been presented to the N. F. Committee for comment as to their admission to N. F. VI. It is expected that this phase of the revision work will be culminated by voting within the next two months.

No.	Sub-Committees. Class.	Chairman.	Number of Monographs. Assigned to Sub.-Com.	Presented to Sub.-Com.	Recommended to N. F. Com.	Ready to Print.
1	Botanicals	E. L. Newcomb	106	...*	76	..
2	Chemicals	G. L. Jenkins	60	46	45	42
3	Solutions	H. A. Langenhan	116	104	85	..
4	Extractive Preparations	W. L. Scoville	145	...*	88	..
5	Solid Preparations	I. A. Becker	28	26	9	9
6	For External Use	L. Saalbach	51	40	22	..
7	Miscellaneous Preparations	A. B. Nichols	50	34	30	19
8	Biologicals	B. Fantus	1	0	0	..
9	Nomenclature	H. V. Arny	...	...	...	..
Special	Dental Preparations	J. R. Blayney	(10)	...	(10)	..
Special	Tablets	A. B. Nichols	55	10	0	..
Special	Ampuls	B. Fantus	29	27	1	..
Special	Gland Substance	B. Fantus	?	...	...	..
Totals			641	287	356	70

* Full monographs not presented to Sub-Committees.

SUB-COMMITTEE ACHIEVEMENTS.

The Sub-Committees have been progressing nicely with the details of monograph construction. We frequently view the progress of monograph revision or construction in three stages. *First*, its presentation to the Sub-Committee; *second*, its recommendation by the Sub-Committee and presentation to the General Committee; *third*, its presentation to the General Chairman as being ready for the printer. Many of the monographs, especially of the new items (ampuls, tablets, glandular substances, etc.) are subject to severe criticism, not only in the Sub-Committee, but later in the General Committee and by the interested public, for a large number of copies of the Bulletin are distributed outside of the N. F. Committee. These criticisms are all carefully considered by the Sub-Committee and its chairman and the complete monograph often bears evidence of these criticisms. The foregoing tabulation shows the progress of the Sub-Committee work.

NATIONAL FORMULARY RESEARCH INVESTIGATIONS.

A number of research investigations, financed by the AMERICAN PHARMACEUTICAL ASSOCIATION and bearing directly in National Formulary revision, have been completed during the past year. These may be briefly described as follows:

Research on Ampuls.—Dr. Bernard Fantus and Dr. E. B. Carter have completed extensive studies on ampul glass, ampul sterilization, and on 24 new ampul monographs. These reports have received extensive criticism in the special Sub-Committee on Ampuls and part of the material has been presented in the N. F. Bulletin.

Research on Pharmaceutical Vehicles.—Dr. B. Fantus and his associates in the Pharmacology Laboratory of the University of Illinois College of Medicine have completed six papers on vehicle preparations and including the Aromatic Eriodictyon Syrup and Elixir, the Glycyrrhiza Syrup and Elixir, Anise Elixir and Syrup, Cinnamon Syrup, Elixir of Phenobarbital and Elixir of Amidopyrine. They also have work in progress on the Pepsin Elixirs, Acacia Syrup, Raspberry Syrup, other fruit syrups, etc. While it is not possible to describe this work in detail in this short report, yet it must be said that the work is having a marked effect on a considerable number of important N. F. items.

Research on Tablets.—Professor A. B. Nichols and Professor L. G. Cordier are actively at work on tests of identity and purity for the 55 tablet monographs submitted to N. F. VI. The tolerances and assay processes prepared by the Joint Contact Committees of the American Drug Manufacturers' Association and of the American Pharmaceutical Drug Manufacturers' Association, and approved by the national enforcement officials, have been adopted so far as possible by the N. F. Sub-Committee on Tablets; otherwise the preparation of these monographs would have proved to be an impossible task. This same statement could be made regarding the ampul monographs. If the years of work by the Joint Contact Committees regarding tolerances and assays had not been available and freely placed at the disposal of the N. F. Committee, these monographs would not have been possible.

Research on Glandular Substances.—A special Sub-Committee headed by Dr. Fantus and including Dr. H. W. Youngken of Boston, and Dr. Marvin R. Thompson of Baltimore, and Dr. F. O. Taylor, Dr. David Klein, Dr. Frederic Fenger, Dr. James H. Hutton, all of Chicago, has been giving special consideration to tolerances and assay methods, histological descriptions and tests of identity and purity for a number of extensively used desiccated glandular substances.

Research on Extractive Processes.—Dr. W. J. Husa and a number of collaborators have reported monthly during the year on their progress in the study of the scientific principles of extraction. Many interesting and important facts have been presented and the work appears to be progressing nicely and it may be possible, even yet to apply in a practical way the results of these extensive investigations to the monographs on extractive preparations in both the U. S. P. and the N. F.

THE PRESCRIPTION INGREDIENT SURVEY.

Especial mention should be made of the Prescription Ingredient Survey which was published in book form in June 1933. The work of originating this survey early in 1930; then pushing forward the accumulation of the data; and finally of preparing the data with extensive introductory chapters in form for publication has been a very heavy item in the chairman's office and has involved a large item of expense in connection with the N. F. revision.

There are more than 5000 primary names and about 1200 cross-references in the tabulated portion of this publication. On the reports as received from the prescription readers, there were approximately 75,000 hand-written names, often synonymic or abbreviated and hurriedly written, and these have been assembled into the 3553 names of ingredients in the U. S. P.—N. F. Survey (Column G). The other names to make a total of about 5000 are found in the six other surveys that were incorporated into the completed report. Also there were approximately a quarter of a million tally marks on these report forms and these have been added and properly applied to each of the names.

Seventeen rolls of adding machine tape have been used in this work and it is estimated that more than 35,000 arithmetical calculations have been utilized in compiling these tabulations and in converting the numbers in all seven of these surveys to 10,000-prescription basis.

However, this Survey has been of very great value to the N. F. Committee, as well as to the U. S. P. Committee, and its value will be reflected in N. F. VI when completed, for a real scientific basis of admission has been established. This new basis is a foundation that will materially strengthen the National Formulary in medical circles and among pharmacists and other scientists.

A quantity of material illustrating the development of the Survey has been placed on exhibition during A. PH. A. week at Madison, and we trust that you will be sufficiently interested to give it the "once over."

On motion of Bradley, seconded by Philip and carried, the report was received with appreciation to Chairman Gathercoal and his associates including those who worked on the U. S. P.—N. F. Prescription Ingredient Survey.

85. Committee on Research. Chairman Arny made a verbal report. Dr. Husa's work under the grant of $1000 made at the Toronto meeting had been splendid and a renewal of the grant for 1933 had already been voted to enable plans to be made for continuing the study of extraction. Dr. Husa will present a short account of the work during a general session and a brief summary for publication in the JOURNAL. The final report will be condensed for later publication on account of cost. The report was accepted on motion of Caspari, seconded by Slocum and carried.

86. Committee on Student Branches. Chairman Philip reported verbally that on account of the present conditions, no special effort had been made to establish student branches although he hoped eventually to see one in each college. One branch, at the California College of Pharmacy, was established during the year. The report was accepted on motion of Day seconded by Arny and carried.

87. Committee on Publications. Chairman DuMez read the following report which was received on motion of Day seconded by Arny and carried:

"Your Committee on Publications respectfully submits the following report on its activities during the past year, and on the status of the ASSOCIATION'S publications.

"*Journal:* The total expenditures for the publication of the JOURNAL for 1932, including the editor's salary, were $19,995.51 ($14,955.51 + $5000.00). The total expenditures for 1931 were $20,364.23 ($15,364.23 + $5000.00), which represents a decrease of $368.72.

"The receipts of the JOURNAL for advertising, subscriptions, sale of single copies, reprints, etc., for 1932 were $8861.37. The subscription credit received for non-headquarters building members less 20% for overhead amounted to $4718.97, making a total of $13,580.34. The total receipts for 1931 were $15,481.67. The receipts have, therefore, decreased by $1901.33.

"The total expenditures of $19,995.51 less the receipts of $13,580.34 show the net cost of the JOURNAL for the year to be $6415.17. The net cost for 1931 was $4882.56. The net cost of the JOURNAL has, therefore, increased by $1532.61 over the preceding year. This increase in cost is due largely to a falling off in membership subscription credits, the falling off amounting to $1293.69. The decrease in receipts from advertising amounted to $605.66.

"The JOURNAL was again printed and distributed by the Mack Printing Company of Easton, Pa.

"Further details relative to the management and publication of the JOURNAL will be presented by Editor Eberle."

Year Book: Volume 19 of the YEAR BOOK covering the calendar year 1930 has been distributed. Three thousand copies were ordered and approximately 2500 of these have been distributed.

"You no doubt have observed that the size of the printed page has been increased materially in this volume. This has enabled us to reduce the number of pages by approximately 25 per cent and to effect a corresponding saving in cost of publication.

"The abstracts for the years 1931 and 1932 will be combined and published in one volume, which it is hoped will be ready for distribution before the end of the year. The page proof for the first half of the volume was about completed before I left Baltimore, and the material for the second half is in process of being assembled and classified.

"The contract for printing, binding and distribution of the book was again awarded to the Lord Baltimore Press of Baltimore, Maryland, because the estimates submitted by other firms did not offer sufficient advantages to justify a change.

"As in the preceding several years, certain journals were again abstracted for the Committee of Revision of the United States Pharmacopœia, to cover the cost of which the Board of Trustees of the Pharmacopœial Convention contributed the sum of $1000.00.

Index of Proceedings and Year Books, 1903–1925: 1047 copies of the Index were printed and bound. Up to June 1, 1933, 377 copies had been sold or otherwise disposed of, leaving a stock on hand of 670 copies.

National Formulary, V: Up to June 1, 1933, a total of 47,626 copies were printed and bound in buckram and 500 copies were bound in leather. Of the copies bound in buckram, 46,526 had been sold and 80 copies had been distributed gratis. Of the copies bound in leather 136 copies had been sold and 12 copies had been distributed gratis. There were sold since June 1, 1932, 1573 copies bound in buckram and 1 copy bound in leather, leaving a stock on hand of 1020 copies bound in buckram and 352 copies bound in leather.

"Permission to use portions of the text of the National Formulary V, for comment in a series of articles to be published in the *Journal of the American Dental Association* was granted to Samuel M. Gordon, secretary of the Council on Dental Therapeutics of the American Dental Association.

"The contract for printing and binding the National Formulary VI was awarded to the Mack Printing Company on July 24, 1933. Estimates on the cost of doing the job were called for and bids were actually received from four firms. That of the Mack Printing Company was the most favorable and the contract was, therefore, awarded to it.

"*Pharmaceutical Recipe Book:* Up to June 1, 1933, 5000 copies of the Recipe Book were printed and bound. Of this number, 4487 copies had been sold and 93 complimentary copies had been distributed, leaving a stock on hand of 420 copies. The stock on hand at the same time last year was 698 copies which means that 278 copies were sold during the year.

"*Prescription Ingredient Survey:* The Prescription Ingredient Survey prepared by Professor E. N. Gathercoal under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION and the Board of Trustees of the United States Pharmacopœia was published in book form by the AMERICAN PHARMACEUTICAL ASSOCIATION. The publication was undertaken with the understanding that a sufficient number of subscriptions to defray the cost of publication would be obtained before the contract for printing was let. Because the book was desired for the meeting of the Revision Committee of the Pharmacopœia held on June 28 to 30, 1933, and the time was too short to secure all of the advanced subscriptions required, Professor Gathercoal went ahead with the printing of the book, even though the stipulated conditions for publication had not been met.

"According to a report made by Professor Gathercoal as of July 27th, a total of 987 copies of the book were ordered printed and bound. Twenty-one (21) copies were sent to Professor Cook for the Committee of Revision of the Pharmacopœia, 15 copies were billed to the AMERICAN PHARMACEUTICAL ASSOCIATION for the use of the Committee of Revision of the National Formulary, 129 copies were distributed on advance orders, and 1 copy was distributed gratis, leaving a stock on hand on July 27th of 821 copies.

"In conclusion your Committee desires to again express its appreciation to the members of the ASSOCIATION who have coöperated in promoting the interests of its publication and to extend thanks on behalf of the ASSOCIATION to the various pharmaceutical journals published in this country for their coöperation in giving publicity to the activities of the ASSOCIATION and its publications."

The secretary reported that the paper required for Series A, numbering 25,000 copies, of the N. F. had been purchased and stored with the Mack Printing Company, in advance of an

increase in price and that the ASSOCIATION would be expected to pay the interest and insurance charges.

88. Editor of the Year Book. Dr. DuMez read the following report:

"Volume 19 of the YEAR BOOK, covering the calendar year 1930, was completed July 17, 1932, and distributed in January 1933. In this volume there are something over 200 pages less than in the preceding volume. This reduction in the number of pages is largely the result of reducing the margins, thereby increasing the size of the printed page. A further reduction was effected by more careful discrimination in the selection of articles to be abstracted. Naturally, this has reduced the cost of the volume to a considerable extent.

"Volumes 20 and 21, covering the calendar years 1931 and 1932, will be published jointly. The printing of the first half of this volume is now in the page proof stage and practically all of the work of assembling and classifying the material for the second half of the book has been completed. If the printer will maintain the present pace, the completed volume will be ready for distribution by the end of the year. We will then have the work as nearly up-to-date as can be expected from a practical standpoint.

"No doubt the Committee on YEAR BOOK will have some definite recommendations to make in its report this year. The consensus of opinion seems to be that some means should be devised whereby the abstracts carried in the report on the progress of pharmacy may be made available to those interested in them sooner than is possible through the YEAR BOOK. There are some, however, who believe that there is a real advantage in having the abstracts assembled in one book, and who prefer to receive them in that way. If the system adopted by the Pharmaceutical Society of Great Britain is followed, the groups representing both viewpoints can be satisfied. Therefore, if a change is to be made, it is my opinion that we will do well to follow the British system, but that the abstracts should be carried in the JOURNAL now printed rather than in a separate publication set up for that purpose."

General satisfaction was expressed that the YEAR BOOK will probably be brought up-to-date during this year. The report was received with thanks, on motion of Day, seconded by Arny and carried.

89. Editor of the Journal. The following report was read by Editor Eberle:

"The report of the Editor herewith deals with the business of 1932 and as reports of previous years, is compared with the prior year, 1931.

"The expenses of 1931 were $15,364.23, not including the Editor's salary; the receipts were $9469.01. Deduction of the receipts, not including membership subscriptions, from expenses shows a net cost of $5895.22, add the Editor's salary, and we have a net cost of $10,895.22. The credit on membership subscriptions, less 20% for overhead from the gross cost, which in 1931 is $6012.66, deducted from the gross cost leaves $4882.56 net cost including the Editor's salary. An average of 5444 copies were printed monthly, making a cost per volume of about 89 cents.

"The expenses of 1932 were $14,955.51; the receipts were $8861.37. Following the plan of the foregoing, deduct the receipts, not including membership subscriptions from expenses shows a net cost of $6094.14. Add the Editor's salary and we have a cost of $11,094.14. The credit on membership subscriptions, not Headquarters members, less 20%, for overhead, which for 1932 is $4718.97 from the gross cost, $11,094.14, leaves $6375.17 net cost, including the Editor's salary; an average of 4990 copies were printed monthly, making a cost of about $1.27, per volume. The difference in net cost of the JOURNAL is $1492.61 more for 1932 than 1931, which is nearly represented by the smaller credit for membership dues in 1932 than in 1931; receipts from advertising were $605.66 less in 1932 than in 1931.

"Detailed comparative costs of 1931 and 1932: The number of copies of the JOURNAL printed in 1931, 65,330; in 1932, 59,900. Although the number of pages printed in 1931 and 1932 was about the same, 1366 in 1931 and 1362 in 1932, considerably more 8-point matter was printed in 1932 than in 1931; the purpose was to bring the larger amount of material embodied in the minutes in the issues of 1932; this to that extent increased the publication costs.

"The number of pages, as stated, printed in 1931 was 1366, in 1932, 1362. The publication costs in 1931 were $11,031.35; in 1932, $10,300.63. Mailing costs of the JOURNAL in 1931 were $665.09; in 1932, $655.21; mailing back numbers of the JOURNAL for 1931 cost $25.70; for 1932, $13.93. Engravings and photographs, other than included in Mack Printing Company cost in 1931, $480.50; in 1932, $479.97. Binding JOURNALS in 1931 cost $24.00; in 1932, $43.50;

stationery and office supplies in 1931, $101.40; in 1932, $86.73. Clerical, including Professor Olsen's contributions to Department of Business Management cost in 1931, $1356.50; in 1932, $1419.00. Commissions on advertising in 1931 amounted to $634.15; in 1932, $554.08. Small miscellaneous items make up the remainder of the total expenses for 1931, of $15,364.23, those of 1932 were $14,955.51, less by $408.72 in 1932 than in 1931.

"Detailed comparative receipts of 1931 and 1932. The receipts for 1931 amounted to $9469.01, those for 1932, $8861.37. Advertising in 1931 brought $6537.13; in 1932, $5931.47. Subscriptions in 1931, amounted to $1050.71; in 1932, $939.91; it should be understood that we make every effort possible to bring subscriptions to memberships. Single copies, in 1931 brought $303.31; in 1932, $51.30. Reprints, in 1931, brought $727.26; in 1932, $1098.14. Miscellaneous items, in 1931, amounted to $815.60; in 1932, $840.55. In 1931, the National Association of Boards of Pharmacy contributed $257.50; in 1932, $80.00. The American Association of Colleges of Pharmacy contributed $300.00 in 1931 and the same amount in 1932. In 1931, J. U. Lloyd contributed $50.00 toward the expense of printing his fourth paper on Physics in Pharmacy and we have now $50.00 from him for the publication of the paper presented at Toronto. The Conference of Pharmaceutical Association Secretaries contributed $25.00 in 1931 toward the expenses of printing their minutes in the JOURNAL. A like contribution was paid in March 1933 for 1932. The Conference of Law Enforcement Officials contributed $50.00 in 1931 and for 1932 (credited in 1933 when it was paid), $75.00. A number of reproductions of pictures and books have been made, without cost to the JOURNAL and ASSOCIATION, and the sum derived from the sale of these was contributed to the JOURNAL—'The Laboratory,' 'Dr. Power in His Laboratory,' 'Ground Breaking at Headquarters,' 'Proof Sheets of U. S. P. I,' 'New Nomenclature,' which with contributions to the expenses of the JOURNAL amounted, in 1932, to $459.05. In recent years the papers presented to the Sections have increased in number and some in the pages of the reports, as a result we have about 25 papers unpublished, several of these lengthy, and a large list has been contributed for this meeting. A paper by Ewin Gillis and H. A. Langenhan—'A Phytochemical Study of Hydrastis Canadensis' is reported in about 130 type pages, many tables and about 25 plates.

"Among the papers in recent years have been theses presented in partial fulfilment of work for degrees. It has occurred to the Editor that part of the expenses for papers of that type should be met by the authors. This suggestion was made to one of the authors, but not favorably received. There are two sides to the question, of course. Another expense that should, perhaps, in part be met by authors is when a large number of cuts are used. Tabular matter should be summarized to an extent. While no name need be mentioned it is a pleasure to report that one of the contributors of two lengthy papers accepted the suggestion to have them printed as monographs with the statement that these papers were presented to the AMERICAN PHARMACEUTICAL ASSOCIATION. Without this coöperation it would not have been possible to print these papers. The JOURNAL has carried the expense of having reprints made of reports and minutes of meetings in connection with the annual convention for distribution at the sessions of the ASSOCIATION and for pharmaceutical publications. Also, abstracts have been mimeographed for like distribution; one hundred or more were prepared for this meeting.

"Another work of interest and value has been undertaken in publishing. 'The Professional Pharmacy—an Analysis of Prescription Department Activities,' by Frank A. Delgado and Arthur Kimball. It is part of the National Drug Store Survey and published under and by authority of the U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce. Reprints will be made under paper cover and placed on sale at 25 cents per copy of 80 or more pages, 10% discount for quantities of 6 or more and 20% in quantities of 100 or more.

"Reference is made to page 671 of the July JOURNAL and a second installment is printed in the August issue of the JOURNAL. It is hoped to have Dr. S. L. Hilton contribute monthly, information on prescription compounding and related subjects.

"Papers relating to U. S. P. and N. F., revision work have appeared in the JOURNAL and coöperation has been given to research work of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers Association.

"To name these papers specifically would extend the report and you, doubtless, are familiar with them.

"In a recent issue, for June, the report of the Committee on Potent and Toxic Drugs of

the National Drug Trade Conference has been printed and quite widely distributed. Also Scope of Examination in Materia Medica and List of Drugs, recommended by the Committee on Materia Medica and approved by the Conference of State Boards and Colleges of N. A. B. P. District No. 2, as a list to which State Board Questions in Materia Medica should be restricted; see JOURNAL for June, pages 551–554 and 559–566.

"Some attention has been given to the Costs of Medical Care. The Department of American Association of Colleges has had many valuable articles under the direction of Professor C. B. Jordan. Attention has been given to the Pharmacy Exhibit, as part of the Century of Progress, International Exposition; also the Pan-American Medical Congress; Prescription Tolerances and other phases of Prescription Practice.

"Reproductions have been made of proof sheets of the first U. S. Pharmacopœia, Chemical Nomenclature and photographic enlargements of pictures of the Headquarters and others of historical interest. Some of these are here on exhibition. Also of the Leadbeater Pharmacy acquired for the ASSOCIATION and in which we had a part.

"Finally, may we say that while we miss the contribution toward meeting expenses of the National Association of Boards of Pharmacy we are grateful for their members' coöperation and of its officers, and hope the time is near when that body will consider the possibility of again contributing. We are thankful for the support of the American Association of Colleges of Pharmacy.

"Up to August first of last year the expenses of the JOURNAL amounted to $8542.00, those of this year are $7298.72; the receipts up to August first of last year were $5150.94, for the same period of this year they are $5022.18, therefore the net cost of the JOURNAL is less by $1114.52 than last year. Personally, the Editor is thankful for the fine coöperation of many."

The necessity of reducing the length of papers for printing in the JOURNAL was considered but no action was taken. On motion of Arny, seconded by Bradley and carried, the report was received.

90. Code for the Retail Drug Industry. The president and secretary informed the members present of their activities in connection with the proposed Code and of the relation of the ASSOCIATION to it. The subject was discussed at length but no action was required at this time.

91. Nomination of Honorary President, Secretary and Treasurer. Dr. Edward Kremers was nominated to the House of Delegates as Honorary President, on motion of Philip seconded by Slocum; E. F. Kelly as Secretary, on motion of DuMez, seconded by Bradley, and C. W. Holton as Treasurer, on motion of Arny seconded by Eberle.

92. Annual Report of the Council to the House of Delegates. Chairman Hilton and the secretary were authorized to prepare and present this report to the House, on motion of Eberle, seconded by DuMez, and carried.

93. Election of Members. On motion of Bradley, seconded by Eberle and carried, the following applicants were elected to membership.

No. 189, S. Walley Bower, 435 Tacoma Ave., Buffalo, N. Y.; No. 190, James A. Conway, 74 Chestnut St., Everett, Mass.; No. 191, C. Bertram Cox, 7 Burran Ave., Mosman, Sydney, Australia; No. 192, Frank R. Crotty, 28 Strathmore Road, Worcester, Mass.; No. 193, Morris Dauer, Clarkson and Albany Aves., Brooklyn, N. Y.; No. 194, C. B. Huddleston, Checotah, Okla.; No. 195, Olin E. Hill, 922 So. 4th St., Clinton, Iowa; No. 196, H. E. Kraft, 2819 West Juneau Ave., Milwaukee, Wis.; No. 197, John D. Laughlin, 602 First Central Bldg., Madison, Wis.; No. 198, J. M. Lea, 733 Main St., Danville, Va.; No. 199, Joseph Lo Pinto, U. S. Veterans' Hospital, Canandaigua, N. Y.; No. 200, John F. McCloskey, 3400 Canal St., New Orleans, La.; No. 201, H. W. Mantz, 18th and Buttonwood Sts., Philadelphia, Pa.; No. 202, Samuel Mushlin, 284 East Spruce St., Manchester, N. H.; No. 203, Edwin A. O'Hara, 165 South St., Jamaica Plain, Mass.; No. 204, Barnet Shapiro, 240 Humboldt Ave., Roxbury, Mass.; No. 205, Sister Michael Maloney, 215 North Ave., Mt. Clemens, Mich.; No. 206, Fred W. Tate, 5548 Washington Ave., St. Louis, Mo.; No. 207, Linwood M. Welch, 1314 Riggs St., N. W., Washington, D. C.; No. 208, Louis C. Zopp, College of Pharmacy, Iowa City, Iowa.

94. Election of Life Member. Dr. J. Leon Lascoff annually offers as a prize in the College of Pharmacy, Columbia University, a Life Membership in the A. PH. A. This year the prize has been awarded to Hymen Cohen, and Dr. Lascoff has forwarded his check for $100.

On motion of Swain, seconded by Eberle and carried, the following was elected to Life Membership.

No. L. M. 1, Hymen Cohen, 915 Elsmere Place, New York, N. Y.

There being no further business the meeting adjourned.

The third meeting of the Council was held on Thursday forenoon, August 31, 1933, Chairman Hilton presiding. The other members present were Arny, Bradley, Day, Dunning, Philip, Slocum, Eberle, DuMez and Kelly.

The minutes of the Second Session were read and approved.

95. Special Committee on Year Book. Chairman George D. Beal read the report of the Committee:

"The Committee on YEAR BOOK begs leave to submit the following report.

"We have continued to study the problem assigned to us, namely, the future of the YEAR BOOK, and are more convinced than ever that the present Report on the Progress of Pharmacy, in spite of its scopefulness and careful preparation is not of sufficient service to the membership of the ASSOCIATION. It is our opinion that the literature of pharmacy must be covered more promptly than at present, and that this can only be done by the monthly publication of an abstract periodical. We were gratified that the Council has accepted this view and expressed itself as favorable to the inauguration of 'Pharmaceutical Abstracts.'

"The Committee, however, does not feel justified in recommending the immediate commencement of this program, realizing that the business situation, the occupation of the National Institute of Pharmacy, and other conditions probably make it impossible for the ASSOCIATION to give the financial support necessary for the launching of this publication. We shall therefore content ourselves with presenting the partial conclusions we have reached during the past year, leaving it to the Council to say whether or not our planning shall be continued.

"*I. Scope of the Journal.* We do not regard this publication as a potential competitor of other abstract periodicals such as *Chemical Abstracts* or *Biological Abstracts*. We would point out, though, that an inevitable overlapping will occur if the JOURNAL is to have sufficient appeal to receive the necessary support from subscribers.

"The classification of the literature to be covered may be expressed briefly as follows:

1. New remedies (proprietary and synthetic).
2. Medicinal chemicals.
3. Pharmacognosy and pharmaceutical botany.
4. Glandular products and vitamins.
5. Serums and vaccines.
6. Galenical preparations and manufacturing pharmacy.
7. Analytical chemistry.
8. Pharmacodynamics and toxicology.
9. Therapeutics.
10. Prescription practice.
11. Pharmacopœias, formularies and bibliographies.
12. Pharmaceutical economics and management.
13. Pharmaceutical education and legislation.
14. History and biography.
15. Patents.

"*II. Size of the Journal.*

Our YEAR BOOK for 1929 was made up as follows:

Group.	Abstracts.	%.	Pages.
Pharmacy	368	20.4	11.75
Materia Medica	137	7.6	38.75
New Remedies	253	14.1	26.50
Pharmacology	309	17.2	85.50
Chemistry Inorganic and Physical	49	2.7	11.75
Chemistry Organic	278	15.4	98.25
Chemistry Analytical	407	22.6	140.75
Total	1801	100.00	313.25

"There has been a feeling that the Report on the Progress of Pharmacy in the YEAR BOOK, while of undoubtedly sufficient scope as to subjects, has not adequately covered the publication field. As an annual volume this degree of scope may be adequate, for current publication it does not seem so. The chairman has therefore made a count of the number of abstracts appearing in the *Squibb Abstract Bulletin* over a typical six weeks' period during the past year with the following result:

Subject.	No. Abstracts.	Per Cent of Total.
Pharmacy	13	2.5
Materia Medica	154	29.5
New Remedies	96	18.4
Pharmacology	104	19.9
Chemistry Inorganic and Physical	14	2.7
Chemistry Organic	96	18.4
Chemistry Analytical	45	8.6
Total	522	100.0
Estimated total for year	4500	

"The difference in percentage distribution in the above table is due largely to a different selection because of company interest.

"It will be difficult, without a careful study of all publications to be abstracted, to make a close estimate of the number of abstracts to be published.

"Realizing that the *Squibb Bulletin* abstracts a good deal that is not of direct pharmaceutical importance, and that the YEAR BOOK should be extended for the sake of completeness, we have arrived at an estimate of approximately 3000 abstracts per year, with about 500 patents in addition. This estimate is concurred in by Miss Pickering of the Squibb Library.

"There is much criticism of *Chemical Abstracts* because of the brevity of the individual abstracts. It is too often necessary to consult the original article for even major details. With a lengthier, but still carefully condensed style of abstract in our JOURNAL, it is believed that our abstracts will run about five to the page, present JOURNAL size. This will call for about 600 pages per year, plus those required for a comprehensive author and subject index, which may approach another 100 pages. The average paging per month, when the JOURNAL gets well under way, will approximate 60 pages. This estimate, however, is not for the first year, but for the JOURNAL in routine publication.

"III. Abstractors Required.

"There should be at least as many abstractors as there are sections in the JOURNAL. For some of these more than one will be required, while other abstractors will have to be selected because of their specific knowledge of languages. It is believed that the number of abstracting hours will approximate the number of abstracts, or a total of about 60 hours per week over the 52 weeks. If it is assumed that an editor will be provided for the journal, the assignment of articles, the indexing and a considerable amount of abstracting will be done by him. As to salaries of abstractors, it may be mentioned that the rate paid by *Chemical Abstracts* was $3.25 per printed page, rather than per abstract, which for a 600-page journal would be under $2000.00. Whether salaried abstractors will be required has not been agreed upon by the Committee.

"It is hoped, however, that a part of the abstracting can be done by forces engaged at present, and that abstracts from certain foreign countries can be obtained on a basis of exchange, which should considerably reduce our expenditures and perhaps eliminate all except that for the editorial office.

"IV. When Shall Publication Begin?

"The Committee believes that it should not make any recommendation, leaving that to those appointed to determine the policies and administer the finances of the ASSOCIATION. It does wish to point out, however, that 'Pharmaceutical Abstracts' need not begin as a separate journal, but that we may begin such publication at any time as a separate part of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, discontinuing the YEAR BOOK at that time. When the ASSOCIATION decides to separate the Commercial and Scientific parts of the JOURNAL,

'Pharmaceutical Abstracts' will go with the latter section, to be split off eventually if circumstances dictate, or to be split off from the present JOURNAL if so required.

"In the opinion of your Committee, there will be less expense involved in adding the abstracts to the present JOURNAL than in inaugurating an abstract journal. The monthly publication of abstracts may be carried on experimentally while all of the abstracting policies, such as scope and length, are being established. The impressiveness and we are sure the popularity of the JOURNAL will be strengthened with an undoubted increase in the subscription list. The complaints regarding the staleness of the Report on the Progress of Pharmacy will be silenced. Finally, even 24 pages of abstracts in each issue of the JOURNAL will be more impressive than a separate 36-page abstract journal.

"*Recommendation.* We recommend that the Report on the Progress of Pharmacy be replaced as soon as financially possible by the monthly publication of 'Pharmaceutical Abstracts.'

"We further recommend that during the first year or more these be published in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, with separate paging and indexing, to be set up as a separate journal when a demand is established therefor.

"We also call attention to the fact that much space may be made available in the present JOURNAL by publishing the full roster of committees, boards, etc., only quarterly or semi-annually, making available over 100 additional pages for publication of abstracts."

After general discussion the report was referred to the Committee on Publications for consideration and action, upon motion of Day, seconded by Dunning and carried.

96. Pharmacy Exhibit at the Century of Progress. It was moved by Day that engrossed resolutions be prepared and forwarded to H. C. Christensen and that suitable letters be forwarded to F. B. Kirby and Julius Riemenschneider expressing the appreciation of the Council for their work as chairman, secretary and treasurer, respectively, of the committee which had charge of the exhibit.

97. Vacation for the Secretary. In the absence of the secretary from the meeting, it was moved by Dunning, seconded by all present and carried, that the secretary be hereby directed to begin, within fifteen days, a vacation of three weeks with a complete discontinuation of all A. PH. A. work.

98. Salary of the Secretary and the Editor of the Journal. On motion of Bradley, seconded by all members present, Secretary Kelly was directed to draw his full salary and that the Editor be requested not to contribute any portion of his salary to the ASSOCIATION'S expenses.

99. American Council on Pharmaceutical Education. D. F. Jones read the following report, signed by himself, E. F. Kelly and H. A. B. Dunning, the A. PH. A. representatives on the Council:

"The final steps in the creation of the Council on Pharmaceutical Education were taken at the Toronto meeting held just about one year ago. Immediately thereafter, the Council representatives, who were present, met and formed a tentative organization on the assumption that such action would enable the Council to begin functioning almost immediately. Unfortunately, the membership of the Council was not completed until January of this year, which held back the work for several months in spite of the foregoing precautions taken to prevent delay.

"Immediately after the membership of the Council was completed, a permanent organization was set up, E. F. Kelly serving as chairman and A. G. DuMez as secretary.

"At the meeting held in Toronto, it was agreed that the setting up of standards for schools of Pharmacy should be the first work undertaken by the Council, and that the standards suggested by Dean Leigh in his presidential address last year be used as the basis for beginning the work. The actual beginning of the work was, however, deferred at the suggestion of the representative of the American Council on Education, who was of the opinion that an effort should first be made to secure the support of the schools which do not hold membership in the American Association of Colleges of Pharmacy and are, therefore, not represented in the present make-up of the Council. The representative of the American Council on Education volunteered to attempt to secure the coöperation of these schools, and the matter was therefore left in his hands. The progress which he has made in this direction cannot be reported at this time, as he was compelled to go to Europe and is not expected to return until the middle of September. During the meantime, however, the secretary of the Council has been assembling data and perfecting plans for going ahead with the work.

"At the Second Meeting of the Council which was held on Sunday evening, August 27, 1933, it was decided to go forward immediately with the program as originally planned, using Dean Leigh's suggested standards as a basis upon which to begin work.

"To defray the expenses of getting started and carrying out the work contemplated for the coming year, the attached budget was approved. As this expense is to be shared equally by each of the three associations represented, it is recommended that an appropriation of $300.00, our proportionate share, be made for this purpose by the ASSOCIATION."

Filing cabinets	$ 50.00
Stationery and office supplies	75.00
Stenography	150.00
Printing and mimeographing	150.00
Assistance in securing and tabulating data	150.00
Postage and express charges	75.00
Telephone calls and telegrams	50.00
Travelling expenses	100.00
Miscellaneous items	100.00
Total	$900.00

100. Committee on Unofficial Standards. The report of the Committee was read by Chairman Krantz:

"*Organization.* Since the presentation of the 1932 report, the personnel of the Committee on Unofficial Standards of this ASSOCIATION has remained practically unchanged. The Committee is divided into two sections, a chemical section under the chairmanship of Dr. Hugo H. Schaefer, and a botanical section under the chairmanship of Professor E. B. Fischer. In addition to the regular members of the Committee there are serving in the capacity of consultants several associate members.

"*Progress of Work.* Last year Doctor Rose submitted a tentative monograph for a preparation containing the glucosides of digitalis suitable for injection. During this year the committee has extensively studied this preparation in collaboration with Dr. James C. Munch, and we feel that a more or less stable and dependable digitalis preparation has been devised. At the Pocono meeting of the Revision Committee of the United States Pharmacopœia, Doctor Scoville spoke of the desirability of including a preparation of this type in the forthcoming revision of the Pharmacopœia. The Committee on Unofficial Standards submitted its work to Doctor Scoville to be studied further for the purpose of including the monograph in the Pharmacopœia.

"*Plans for Future Work.* The Committee in planning its future work invites the suggestions from ASSOCIATION members interested in the establishment of standards. It is their purpose during the coming year to project our preparation of monographs and standards to some of the new and more generally used unofficial drugs."

It was received on motion of DuMez, seconded by Arny and carried.

After a general discussion of the work of the Committee and upon the suggestion of Chairman Krantz, the committee was discontinued, on motion of Bradley, seconded by Philip and carried, since there seems to be no present need for the committee.

101. Expenses of the President and the Contacting of Graduates of the Schools and Colleges of Pharmacy. President Philip submitted suggestions dealing with these subjects which, after discussion, were referred to the Committee on Finance for study when the finances of the ASSOCIATION justify, on motion of Bradley, seconded by Arny and carried.

102. Reprints of the President's Address. It was moved by Dunning, seconded by Arny and carried, that fifty reprints of his address be sent complimentary to the retiring president.

The meeting then adjourned.

The Fourth Meeting of the Council of 1932–1933 was held on Friday evening, September 1, 1933. Chairman Hilton presided and the other members present were Arny, Bradley, Day, Eberle, DuMez, Slocum and Kelly.

The minutes of the Third Meeting were read and approved.

The chairman announced that the work of the Council was completed and declared the Council adjourned.

E. F. KELLY, *Secretary.*

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1933-1934.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 1.

September 1, 1933.

To the Members of the Council:

The reorganization and First Meeting of the Council 1933–1934 was held in the Hotel Loraine, Madison, Wisconsin, on Friday, September 1, 1933, beginning at 10:25 P.M.

1. The roll was called and the following were present: Arny, Adams, Swain, Krantz, Fischelis, Hilton, Kelly, Eberle, DuMez and Costello.

2. Election of Chairman. S. L. Hilton was elected Chairman of the Council for 1933–1934 on motion of Swain, seconded by Arny and carried.

3. Election of Vice-Chairman. C. H. LaWall was elected Vice-Chairman of the Council for 1933–1934 on motion of Arny, seconded by Adams and carried.

4. Election of Editor of the Journal. E. G. Eberle was elected Editor of the JOURNAL for 1933–1934 on motion of Adams, seconded by Fischelis and carried.

5. Election of Editor of the Year Book. A. G. DuMez was elected Editor of the YEAR BOOK for 1933–1934 on motion of Eberle, seconded by Arny and carried.

6. Membership of the Council. The membership and officers of the Council for 1933–1934 are as follows:

ELECTED MEMBERS.

H. A. B. Dunning, Charles and Chase Sts., Baltimore, Md. (Term expires 1934.)
S. L. Hilton, 1033 Twenty-Second St., N. W., Washington, D. C. (Term expires 1934.)
Ambrose Hunsberger, 1600 Spruce St., Philadelphia, Pa. (Term expires 1934.)
J. H. Beal, Fort Walton, Fla. (Term expires 1935.)
C. E. Caspari, Euclid and Parkview Aves., St. Louis, Mo. (Term expires 1935.)
C. H. LaWall, 214 S. 12th St., Philadelphia, Pa. (Term expires 1935.)
H. V. Arny, 115 W. 68th St., New York, N. Y. (Term expires 1936.)
H. C. Christensen, 130 N. Wells St., Chicago, Ill. (Term expires 1936.)
W. D. Adams, Forney, Texas. (Term expires 1936.)

EX-OFFICIO MEMBERS.

R. L. Swain, 2411 N. Charles St., Baltimore, Md.
R. P. Fischelis, 28 W. State Street, Trenton, N. J.
John C. Krantz, Jr., 2411 N. Charles St., Baltimore, Md.
E. F. Kelly, 10 West Chase St., Baltimore, Md.
C. W. Holton, Box 81, Essex Fells, N. J.
P. H. Costello, Cooperstown, N. Dak.
E. G. Eberle, 10 W. Chase St., Baltimore, Md.
A. G. DuMez, Lombard and Greene Sts., Baltimore, Md.

OFFICERS OF THE COUNCIL.

S. L. Hilton, *Chairman.*
C. H. LaWall, *Vice-Chairman.*
E. F. Kelly, *Secretary.*

7. Finance Committee. Chairman Hilton appointed R. L. Swain, Chairman, C. H. LaWall and C. W. Holton as members of the Committee on Finance, and these appointments were confirmed on motion of Adams, seconded by DuMez and carried.

8. Committee on Property and Funds. The personnel of this Committee, as provided for in the Council By-Laws is, as follows for 1933–1934: R. L. Swain, C. W. Holton, S. L. Hilton, H. C. Christensen and E. F. Kelly.

9. Committee on Publications. Chairman Hilton appointed H. V. Arny, C. H. LaWall and Walter D. Adams as members of the Committee, the other members being E. G. Eberle, E. F. Kelly, A. G. DuMez and C. W. Holton, as provided in the By-Laws. These appointments were confirmed on motion of Adams, seconded by Costello. Chairman Hilton appointed A. G. DuMez as Chairman of the Committee on Publications.

10. Committee on Standard Program. The chairman appointed S. L. Hilton, T. J. Bradley and E. F. Kelly as members of the Committee on Standard Program.

11. Committee on Year Book. The chairman appointed the following members: Geo. D. Beal, Chairman, F. W. Nitardy, H. W. Youngken, E. N. Gathercoal, E. E. Swanson, J. C. Munch and J. C. Krantz, Jr.

12. Executive Committee of the Council. It was moved by Arny that the chairman be authorized in case the occasion should arise to appoint an Executive Committee consisting of seven members. The motion was seconded by Adams and carried.

13. Committee on Pharmaceutical Research. On motion of Fischelis, seconded by Adams and carried, H. V. Arny and C. H. LaWall were elected members of this Committee to serve until 1938.

14. Commission on Proprietary Medicines. C. E. Caspari was elected a member of this Commission to serve until 1938, on motion of DuMez, seconded by Krantz and carried.

15. Committee on Recipe Book. After a general discussion, it was moved by Arny that the Committee on Recipe Book be continued for one year. The motion was seconded by Adams and carried.

It was moved by Arny that a special committee be appointed to study the matter of putting the Committee on Recipe Book on a ten-year basis and also its personnel. The motion was seconded by Fischelis and carried.

16. Appointment of Standing and Special Committees and Delegates of the Association. The president was authorized, on motion of Adams, seconded by Arny and carried, to make such appointments as are now authorized, to fill vacancies as they may occur and to make additional appointments as may be necessary or advisable, during the year.

The meeting then adjourned.

E. F. KELLY, *Secretary.*

To Dr. and Mrs. Edward Kremers in appreciation of hospitality to their guests at the lawn party given at their home to visiting friends of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Last evening as we stood upon your lawn
And looked around the lovely country side,
How beautiful it was at eventide!
How splendid must it be at early dawn!

You chose a charming spot your home to rear,
So neatly placed upon the gentle slope,
That on each side you get the fullest scope
Of landscape spreading far and wide and clear.

We saw it first in all its wide extent
With full horizon circled to our view;
We saw Mendota, lying clear and blue,
Serenely calm and placidly content.

Then, as the sun sank slowly out of sight
And shadows fell upon the lovely scene,
A peaceful silence, simple and serene,
Descended with the duskiness of night.

Then o'er the scene there came a gradual change;
The moon, near full, rose steadily on high
And stars began to twinkle in the sky,
Effecting a new picture, quaintly strange.

We stood awhile close wrapped in night's embrace
Then went within your neat and cozy home.
Our feelings there were those which surely come
To all who enter first your peaceful place.

Its atmosphere reflects your own fine calm,
Your dignity most courteous and benign.
We understand it was your own design—
Like ancient Horace with his Sabine Farm.

How fortunate you are in your retreat
From all the bickerings and all the strife
From all the noise and din of city life;
Your joys of home must surely be complete.

The evening meal kept all of us employed,
For every one partook with keen delight
Such food, indeed, went well with such a night
The whole of which we thoroughly enjoyed.

We wish that you should know just how we feel
About you, and about your lovely home
May happiness for many years to come
Be yours—with friendships, many true and real.

WAYLAND D. WILCOX.

REPORT OF THE FAIRCHILD SCHOLARSHIP EXAMINATION.

A special committee on Fairchild Scholarship reported at the Toronto meeting and suggested a plan of examination. This committee was composed of Prof. C. C. Glover, Chairman, University of Michigan; Dr. Glenn L. Jenkins, University of Maryland; Dr. F. A. Gilfillan, State College, Corvallis, Oregon. It so happened that the University of Michigan had no candidate to present this year and Professors C. C. Glover, C. H. Stocking, F. F. Blicke and J. L. Power kindly consented to prepare the examination questions and grade the papers. It was, therefore, an opportunity for Chairman Glover to make use of the report of the Special Committee.

Twenty-seven candidates participated in the examination; it will be noted that several tied in averages, hence 22 averages are listed. The pharmacy school records extended over different periods and the results may be of interest. Fourteen had concluded a course in Pharmacy, extending over three years; their averages were, respectively, 44, 50, 51, 52, 53, 56, 58, 60, 62, 63, 64, 65, 74, 75. Ten of the candidates had completed a four-year course and their averages are: 81, 79, 73, 72, 69, 67, 63, 59, 58, 41. One candidate has carried on work for five years and made an average of 58. Two candidates with six-year records, were graded 74 and 59, respectively. Eighteen schools were represented in the examinations. The subjects were given under the following divisions: Chemistry, Materia Medica and Pharmacy. The results are given in the following tabulation:

	Chemistry.	Materia Medica.	Pharmacy.	Average.
1	65	94	84	81
2	76	86	76	79
3	71	84	72	75
4	70	75	79	74
4	63	86	74	74
5	61	87	71	73
6	73	84	60	72
7	66	74	67	69
8	43	86	73	67
9	50	84	63	65
10	50	82	60	64
11	49	80	61	63
11	43	81	66	63
12	59	78	51	62
13	52	76	54	60
14	36	86	57	59
14	30	78	70	59
15	36	77	63	58
15	60	63	53	58
15	30	84	61	58
16	53	77	39	56
17	25	77	59	53
18	37	66	53	52
19	25	77	54	51
20	30	51	69	50
21	17	68	48	44
22	25	63	37	41

There were twenty-seven candidates, several of whom tied in their general averages. The general averages for the twenty-seven candidates are: Chemistry, 48; Materia Medica, 78; Pharmacy, 62.

The first candidate in general average, 81, is a student of a four-year course. He was fifth in Chemistry, first in Materia Medica and first in Pharmacy. The second candidate, 79, was first in Chemistry, third in Materia Medica, third in Pharmacy. The third candidate, 75, ranks third in Chemistry, tied with three others in Materia Medica for sixth place, was sixth in Pharmacy. Two, on average, tied for fourth place, one stood fourth in Chemistry, twentieth in Materia

Medica, second in Pharmacy; the other was sixth in Chemistry, tied with four for third place in Materia Medica, fourth place in Pharmacy. There are a number of unusual standings but these will happen. Perhaps gradings of candidates from the same school may be of interest: Average 69 and 79; Chemistry, 66 and 76; Materia Medica, 74 and 86; Pharmacy, 67 and 76. Average, 75 and 74; Chemistry, 71 and 63; Materia Medica, 84 and 86; Pharmacy, 72 and 74. Average, 41 and 59; Chemistry, 25 and 36; Materia Medica, 63 and 86; Pharmacy, 37 and 57. Average, 58 and 72; Chemistry, 36, 73; Materia Medica, 77 and 84; Pharmacy, 63 and 60. Average, 62 and 58; Chemistry, 59 and 60; Materia Medica, 78 and 63; Pharmacy, 51 and 53. Average, 63 and 56; Chemistry, 49 and 53; Materia Medica, 80 and 77; Pharmacy, 61 and 39. Average, 64 and 60; Chemistry, 50 and 52; Materia Medica, 82 and 76; Pharmacy, 60 and 54. Average, 58 and 51; Chemistry, 30 and 25; Materia Medica, 84 and 77; Pharmacy, 61 and 54. Average, 50 and 53; Chemistry, 30 and 25; Materia Medica, 51 and 77; Pharmacy, 69 and 59.

The chairman desires to thank his colleagues for their support and the members of the Examining Committee for their helpfulness; he hopes that he has not taxed their patience.

The winning candidate is Miles Edward Drake, of the Oregon Agricultural College, School of Pharmacy, Corvallis. He graduated from High School and entered as a freshman in the School of Pharmacy, September 27, 1929, and graduated June 5, 1933, with the degree of B.S.

W. Bruce Philip
C. H. Stocking
Clare Allan
E. G. Eberle, *Chairman.*

MILES EDWARD DRAKE.

(Winner of the Fairchild Scholarship for 1933.)

Miles Edward Drake was born in Salt Lake City, Utah. He received his earlier education in Oregon and was graduated from Franklin High School, Portland, June 17, 1927, receiving his highest grades in science subjects; during his high school and later college career he took an active part in athletics, winning his letter in soccer. After leaving high school he had one year of surveying experiences and one year of office work with the United States Bureau of Public Roads.

MILES EDWARD DRAKE.

In 1927, he entered the Oregon State College School of Pharmacy and received his B.S. degree in Pharmacy, June 5, 1933. In addition to completing the pharmacy curriculum, he took special work in bacteriology.

He is a former president of the Oregon State College Pharmaceutical Association and of Rho Chi Chapter, member of Phi Kappa Phi, all-institution honor student of the College and a member of Alpha Tau Omega social fraternity, and was awarded the Lehn & Fink medal in 1933. He passed the Oregon State Board of Pharmacy examinations with a high average. His home address is 6123—83rd Ave., S. E., Portland, Oregon.

The Drug and Cosmetic Industry has issued the second edition of the "Drug and Cosmetic Catalog," edited by Francis Chilson. The volume contains about 350 pages and its table of contents includes Machinery and Packaging, Raw Materials, Statistics and Association.

ABSTRACTS OF PAPERS PRESENTED BEFORE SCIENTIFIC SECTION, AMERICAN PHARMACEUTICAL ASSOCIATION, MADISON MEETING, 1933.

"Assay for Benzoate and Salicylate," by Jacob Schmidt and John C. Krantz, Jr.—A rapid volumetric method has been devised for the determination of sodium salicylate and benzoate, which consists of titrating the alkali in combination with the organic acid in the presence of ether in methyl orange.

"Detection of Small Quantities of Carbon Monoxide in Medicinal Oxygen," by Jacob E. Schmidt and John C. Krantz, Jr.—A method has been devised to determine small qantities of carbon monoxide in medicinal oxygen by a modification of the iodine pentoxide method.

"The Water Content of Magnesium Oxide," by Jacob E. Schmidt and John C. Krantz, Jr.—A study has been made of various commercial samples of light and heavy magnesium oxide in respect to the amount of water that might be found present. The water content of the oxide was compared under several conditions.

"The Barbituric Acid Derivatives as Drugs," by J. H. Graham.—This paper, which is a brief but comprehensive review of the literature during the last thirty years, on the derivatives of barbituric acid used as drugs, calls attention to the numerous new preparations, many of which are being actively experimented with in research laboratories; enumerates their important physiological properties; emphasizes their toxic properties; and, finally urges that pharmaceutical and medical societies endeavor to bring about proper legislation toward prevention of promiscuous sale of these drugs, and the prevention of the use of the same by the laity except on physician's prescription.

"The Gravimetric and Volumetric Determination of Antipyrine as Hydroferrocyanide in the Presence of Amidopyrin," by I. M. Kolthoff.—In acid medium antipyrine gives a crystalline precipitate with ferrocyanide having the composition $(C_{11}H_{12}N_2O)_2H_4Fe(CN)_6$. By means of this precipitation reaction 2.5 mg. antipyrine can be detected in 5 cc. of solution. A gravimetric and volumetric procedure has been described for the quantitative estimation of antipyrine in the form of its hydroferrocyanide. The method can be applied in the presence of pyramidon.

"Tincture of Digitalis," by L. W. Rowe and W. L. Scoville.—A continuation of the work reported two years ago. Three series of five samples each, and varying in many particulars, were subjected to stability tests and it was found that only the samples which contained anhydrous sodium acetate were fairly stable in activity. A formula for the preparation of Tincture Digitalis is offered as a definite subject for consideration.

Also a continuation of work reported two years ago. Four series of three samples each varying in some important particular were subjected to stability tests and it was found that the use of a small amount of hypophosphorous acid seemed to retard deterioration.

PHARMACY WEEK NATIONAL WINDOW CONTEST.

ANTON HOGSTAD, JR., NATIONAL CHAIRMAN, PHARMACY WEEK EXECUTIVE COMMITTEE, 161 SIXTH AVE., NEW YORK, N. Y.

The Federal Wholesale Druggists' Association has donated a beautiful silver cup to be awarded by the National Executive Committee on Pharmacy Week for the best professional window display exhibited in any retail pharmacy in the United States during Pharmacy Week, October 9 to 14, 1933.

RULES OF CONTEST.

1. A professional window display, it has been determined, is a display picturing any subject pertaining to professional pharmacy, pharmaceutical education, legislation, literature, etc.

2. The best professional window display will be selected from photos taken of windows dressed in accordance with Rule 1 of the Contest, and submitted as follows:

(*a*) The secretary of each state pharmaceutical association will send in to National Pharmacy Week headquarters, 161 Sixth Ave., New York, N. Y., the photo of the best professional window display of his state. He may determine the best display by a state contest or by some other method which he or his association may select.

(*b*) No photos may be sent direct by contestants to National Pharmacy Week headquarters—they must be sent to the secretaries of the state associations to which the contestants belong, for competition in the state contests. The secretary of each state association will then mail the winning photograph in his state to National Pharmacy Week headquarters for competition in the National Contest.

(*c*) The District of Columbia will be considered as a state association and the secretary of its pharmaceutical association will submit the winning photograph to National Pharmacy Week headquarters to be entered in the National Pharmacy Week Window Contest.

3. Photos submitted must show the entire window. The photos must be large enough so that details of display will be plainly shown and, although no definite restrictions are made, it can hardly be expected that this could be accomplished in a photo smaller than 5″ x 7″; 8″ x 10″ being the ideal size.

4. Competing windows must be non-commercial although manufactured pharmaceutical, chemical and biological products which are related to the practice of professional pharmacy may be displayed. Merchandise unrelated to professional pharmacy must not be displayed. Price tags must not be used.

5. No photos will be accepted as eligible for the National Pharmacy Week Window Contest if postmarked later than midnight of Dec. 1, 1933.

6. The winner of the 1933 contest will be decided by a committee of five judges, consisting of prominent pharmaceutical figures from the city of Chicago.

7. Announcement of award of the championship trophy will be made through the pharmaceutical journals of the nation and the silver cup will be formally presented to the winner.

An Exhibit of Preparations of the Pharmaceutical Recipe Book, A. PH. A., by Chairman J. Leon Lascoff, displayed at the Madison meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION; it shows the possibilities for Pharmacists.

EDITORIAL NOTES

THE PHARMACOPŒIA WILL ESTABLISH AN OFFICIAL METHOD FOR PREPARING PERCENTAGE SOLUTIONS.

The following is taken from the report of Chairman E. F. Cook, presented at the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, held in Madison.

The correct method for preparing a percentage solution for medicinal use has long been in dispute. Some authorities have always insisted upon using the "weight–weight" (w/w) method as the only correct procedure. Others have argued with equal insistence that the "weight–volume" (w/v) method was the only practical plan. The new British Pharmacopœia has led the way to make the practice in drug stores uniform by prescribing an official method as follows:

PERCENTAGE SOLUTIONS.

"In defining standards, the expression 'per cent' is used according to circumstances with one of three different meanings. In order that the meaning to be attached to the expression in each instance may be clear, the following notation, which has long been in use by pharmacists, has been adopted.

"*Per cent w/w, percentage, weight in weight,* expresses the number of Gm. of active substance in 100 Gm. of product.

"*Per cent w/v, percentage, weight in volume,* expresses the number of Gm. of active substance in 100 millilitres of product.

"*Per cent v/v, percentage, volume in volume,* expresses the number of millilitres of active substance in 100 millilitres of product.

"The strengths of solutions of solids in liquids are expressed as percentage weight in volume, of liquids in liquids as percentage volume in volume, and of gases in liquids as percentage weight in weight.

"In the dispensing of prescriptions, when the expression 'per cent' is used without qualification, it is to be interpreted to mean, for solutions of solids in liquids, per cent weight in volume, for solutions of liquids in liquids, per cent volume in volume, for solutions of gases in liquids, per cent weight in weight. Thus, a '10 per cent' or a '1 in 10' solution is prepared by dissolving 10 Gm. of a solid, or 10 millilitres of a liquid, in sufficient of the solvent to make 100 millilitres. A solution of the same strength may be prepared on the Imperial System, and on the Apothecaries' System, by dissolving 44 grains (more precisely 43.847 grains) of a solid, or 48 minims of a liquid, in sufficient of the solvent to make 1 fluidounce (480 minims) of solution."

Our own Committee of Revision, after discussion, voted at the recent Conference to introduce a similar paragraph in the new Pharmacopœia.

THE REVISION OF THE FOOD AND DRUGS ACT IN ITS RELATION TO THE U. S. P.

No one can now predict the final form in which the rewritten Federal Food and Drugs Act may be passed by Congress or when that may occur, but it is of the utmost importance to the work of our Committee and to the future of the United States Pharmacopœia that it should retain essentially the status proposed in the first draft offered to Congress by the Secretary of Agriculture, and introduced into both the Senate and the House.

The added recognition of Pharmacopœial standards, covering as it does the U. S. P. and N. F. definitions, descriptions, formulas, tests, assays and the packaging and labeling specifications, places greatly increased responsibility upon the decisions of the U. S. P. Revision Committee.

The "variation clause" is retained to meet the legitimate need for modifications in official products, such as the demand for a "Half-Strength or Double-Strength Ointment of Mercuric Oxide," "Half-Strength Tincture of Iodine," etc., and to allow the sale of products of technical grade and also to permit the sale of established preparations differing in flavor, color or strength from the official. However, the new requirement will compel a labeling which clearly indicates wherein the unofficial product differs in strength, quality and purity from the specifications of the Pharmacopœia or National Formulary. This has not been a part of the law heretofore.

The feature which authorizes the secretary to prescribe additional tests or assay methods to determine whether or not the official standards are being complied with, should it be found necessary, is entirely new.

This, however, greatly strengthens the position of the Pharmacopœia, for no vital objective or responsibility of our Committee

is disturbed and the enforcement of the necessary standards, which our Committee have established, is helped. The first duty of the Committee of Revision is to decide the scope of the new Pharmacopœia, that it may represent the therapeutic agents of the day believed to be worthy of recognition. This duty remains exclusively in our hands.

ACCURACY OF VITAMIN A TEST IN RELATION TO DURATION OF TEST.

By a statistical examination of the results of 201 vitamin A tests, the accuracy of such tests for a period of dosing of one to five weeks was determined. The experiments were carried out by the usual method of feeding rats on a diet deficient in vitamin A until they ceased to grow and then giving, in addition, doses of the substance under examination for a period of five weeks. The results were calculated from the responses of the rats alive at the end of each week of the test; 1129 buck and 1282 doe were alive at the end of the first week and 960 buck and 1110 doe at the end of the fifth week. The curves relating increase in weight to dose of vitamin A given were found to be approximately logarithmic for each week as would be expected from those previously published for five weeks' growth.

The standard deviation of the increase in weight of these rats was found to increase with the length of the test. This result was contrary to that of Norris and Church (*J. Nut.*, 5 (1932), 495). The probable error of an estimation was determined for groups of ten buck or ten doe for each week. The error was found to decrease rapidly up to the third week, and then very slowly. The values for the probable error of a result at three weeks were 21 per cent above or 18 per cent below the true value for buck and 30 per cent above or 23 per cent below the true value for doe. The corresponding figures for a five weeks' test were 17 per cent above or 15 per cent below the true value for buck and 24 per cent above or 19 per cent below the true value for doe. The author therefore maintains that the increase in accuracy would not in general justify the extra expenditure of time and labor.—K. H. Coward, The Pharmacological Laboratories of the Pharmaceutical Society (*Biochem. J.*, 27 (1933), 445).

OBITUARY.

HENRY G. GREENISH.

Prof. Henry G. Greenish, *honorary member* of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1913, died at his home Willesden Green, London, England, on August 2nd, aged 78 years. He was the son of the late Thomas Greenish, president of the British Pharmaceutical Society in 1880–1882 and of the British Pharmaceutical Conference in 1886; the son, Henry G., was apprenticed to his father, he won a Bell scholarship in 1875 and in 1876–1877 earned five silver medals in addition to that of the Society. After passing the Major examination he was for a time demonstrator in the School of the British Pharmaceutical Society. He continued his studies at the Universities of Dorpat and Vienna and returning to his *Alma Mater*, was appointed a lecturer (1890) and professor in 1893. The office of Dean of the School and Professor of Pharmaceutics was established a few years later; and on the recognition of the School by the University of London he became its Professor of Pharmaceutics.

Professor Greenish took an active part in the revisions of the British Pharmacopœia for 1898 and 1914, and was joint editor of the latter. He was a member of the Commission set up in connection with the preparation of the British Pharmacopœia, 1932.

In 1911, with Sir William S. Glyn-Jones he toured Continental countries in order to gain information on the working of health insurance systems. During the World War he was frequently called upon by the Government with problems submitted by various departments.

He was author of "A Text Book of Pharmacognosy," now in its sixth edition; "The Microscopical Examination of Foods and Drugs;" and (in collaboration with the late M. Collin) of an "Anatomical Atlas of Vegetable Powders;" his work in connection with the British Pharmaceutical Codex extended over many years and from 1891 to 1926 the "Year Book of Pharmacy" bears witness to his varied research. Dr. Greenish was president of the British Pharmaceutical Conference in 1922, the year of his silver wedding. In 1917 he received the Hanbury Medal and in 1920 the University of Paris conferred on him the honorary Doctor's degree.

PERSONAL AND NEWS ITEMS.

Wayland D. Wilcox, of Philadelphia, described the trip to the Dells of the Wisconsin River and the Indian Pageant in verse and in like manner expressed appreciation of the entertainment given at the home of Dr. and Mrs. Edward Kremers.

Mrs. Adolph Menges and the members of the Ladies Auxiliary carried out the entertainment programs most successfully. Mr. Menges could not participate actively in the program on account of poor health, but was greatly interested in all events. Appropriate resolutions adopted by the ASSOCIATION speak for the enjoyment given to the members and this mention is made for all who so splendidly contributed to the hospitalities and entertainment features.

Baltimore and Maryland were largely represented at the meeting; while this exhibited the interest of the members in the ASSOCIATION, it was also expressive of their friendship for President R. L. Swain and others of the official family.

The fraternities and a number of the colleges gathered around the festive board and renewed acquaintances.

Mathias Noll, Kansas historian, sent his history of Kansas pharmacy for inspection to the meeting of the Section on Historical Pharmacy. The volume is comprehensive and represents the work of years and sets an example for other states to follow.

Mississippi Pharmaceutical Association recorded the celebration of its 50th anniversary in a "Gold Book."

Treasurer Charles W. Holton and Mrs. Holton have returned from an extended trip covering a large part of Europe.

The doctorates conferred by American Universities are reported in *Science,* and in the *Journal of Chemical Education;* among these are thirteen degrees in pharmacy and pharmacology.

Secretary E. L. Newcomb, of the N. W. D. A., advises druggists to secure from their wholesale druggists Pharmacy week maps for use in their displays.

J. Leon Lascoff advises that on October 24th a joint meeting of physicians and pharmacists will be held in Hotel Pennsylvania, New York City. Each pharmacist will be mailed two tickets and it is expected that one will be used by the pharmacist and the other is for a physician. The purpose is to have equal representation of physicians and pharmacists.

Dr. Lascoff also reports on the NRA Day parade participated in by pharmacists, among them were a number of veterans well over 70 years of age; **Dr. Schleussner,** who has passed the 84th milestone persisted in marching, but was persuaded to leave the procession at 52nd Street after having marched more than a mile.

Dr. H. H. Rusby has published a book on "Jungle Memories." Comment on this book will be made in a later issue of the JOURNAL.

Dr. B. V. Christensen has been appointed director of the School of Pharmacy, University of Florida; Dr. Townes R. Leigh was named dean of the College of Arts and Sciences, following the merger of the College of Pharmacy with the College of Arts and Sciences.

John F. McCloskey succeeds **Prof. J. J. Grasser** as dean of Loyola College of Pharmacy, New Orleans.

Prof. Julius Stieglitz, of the University of Chicago, has announced his retirement from administrative work of conducting the chemistry department of the university to devote his time entirely to research work. A dinner in his honor was given September 11th, by former students and leading chemists in the United States and foreign countries.

The formal award of the Remington Honor Medal to **Secretary E. F. Kelly,** A. PH. A., will be made on Oct. 11th, at the New York College of Pharmacy. A dinner at 6:00 P.M. will precede the presentation for which an interesting program has been prepared. A large attendance is expected; for further information address Secretary Rudolph O. Hauck, 113 68th St., New York City.

CANADIAN PHARMACEUTICAL ASSOCIATION.

The twenty-first annual meeting of the Canadian Pharmaceutical Association, which opened on Tuesday morning, August 22nd, was one of the best attended conventions ever held in the history of the Association. The druggists turned out in good numbers at every session, and showed keen interest in every paper and problem presented.

One of the special features of the Luncheon on Tuesday, August 22nd, was the presentation of a Scroll to Prof. V. E. Henderson, Toronto, enrolling him as an *Honorary Member* of the C. Ph. A.

SOCIETIES AND COLLEGES.

LIST OF REGISTRANTS, ANNUAL MEETING, A. PH. A., MADISON, WIS.

Corrections and additions are respectfully requested; a number, evidently, failed to sign the official Registration Book; the names are given as recorded. Please address JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION, 10 W. Chase St., Baltimore, Md. *A second list will be published in the October* JOURNAL.

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ARNY, H. V., New York, N. Y.

BACON, FRANKLIN J., Cleveland, Ohio.
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BALLEW, J. G., Lenoir, N. Car.
BANG, HAAKON, Pullman, Wash.
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BEAL, GEORGE D., Pittsburgh, Pa.
BENEZRA, LENA, MISS, Madison, Wis.
BERG, FRANTZ F., Floral Park, N. Y.
BIBBINS, F. E., Indianapolis, Ind.
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BRADLEY, THEODORE, Boston, Mass.
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BROWN, HENRY, Scranton, Pa.
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BUNTING, GEORGE A., Baltimore, Md.
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BURNIAC, JOSEPH J., Detroit, Mich.
BURT, JOSEPH B., Lincoln, Nebr.

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CHILDS, MAC, El Dorado, Kansas.
CHRISTENSEN, B. V., Gainesville, Fla.
CLARK, RALPH W., Madison, Wis.
CLAUS, EDWARD P., Pittsburgh, Pa.
CLAYTON, CHARLES J., Denver, Colo.
COLE, B. OLIVE, Baltimore, Md.
COLLINS, GEORGE W., Chicago, Ill.
COMBS, D. E., Los Angeles, Calif.
COOK, E. FULLERTON, Philadelphia, Pa.
COOK, ROY B., Charleston, W. Va.
COOPER, ZADA M., Iowa City, Iowa.
COSTELLO, P. H., Cooperstown, N. Dak.
CULTER, S. H., Tuckahoe, N. Y.
CURRY, G. L., Louisville, Ky.

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GILBERT, C. T., Noroton, Conn.
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GRAHAM, KATHERINE, Madison, Wis.
GRAY, WM., Chicago, Ill.
GUSTAFSON, CHARLES, JR., Hartford, Conn.

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HARRISON, HARRY S., Baltimore, Md.
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HAYMAN, J. LESTER, Morgantown, W. Va.
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HENRY, M. NORTON, Lowell, Mich.
HILL, OLIN E., Clinton, Iowa.
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JOHNSON, HENRY S., New Haven, Conn.
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JONES, ROWLAND, Gettysburg, S. Dak.
JORDAN, C. B., La Fayette, Ind.
JUSTICE, ROBERT S., Columbus, Ohio.

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MCCULLOUGH, F. V., New Albany, Ind.
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MEISSNER, F. W., La Porte, Ind.
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NEWCOMB, LOIS, MISS, Montclair, N. J.

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OLSON, LIONEL A., Madison, Wis.
OSOL, ARTHUR, Philadelphia, Pa.

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RICHTMANN, W. O., Madison, Wis.
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ROGERS, C. H., Minneapolis, Minn.
ROSIN, JOSEPH, Rahway, N. Y.
ROTHROCK, RUSSELL, B., Evansville, Ind.
ROWE, LEWIS W., Detroit, Mich.
RUDD, W. F., Richmond, Va.
RUDY, H. R., Hagerstown, Md.
RUENZEL, H. G., Milwaukee, Wis.
RUSSELL, OSCAR E., Elkhart, Ind.

SANTILLI, M. A., Milwaukee, Wis.
SASS, H. A., Redfield, S. Dak.
SAWYERS, MABELLE M., Oakland, Calif.
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SCHAEFER, HUGO, New York City.
SCHICKS, G. P., Newark, N. J.
SCHLICHTING, A. F., St. Louis, Mo.
SCHLICHTING, HAROLD E., Lansing, Mich.
SCHMITZ, E. C., Plattsville, Wis.
SCHNAIDT, H. J., Parkston, S. Dak.
SCHOETZOW, R. E., Brooklyn, N. Y.
SCHRAM, W. H., Hillsboro, N. Dak.
SCHWARZ, A. JOHN, Memphis, Tenn.
SCOTT, S. M., JR., Charleston, W. Va.
SLAMA, FRANK J., Baltimore, Md.
SLOCUM, J. W., Indianola, Iowa.
SMITH, F. A. UPSHER, St. Paul, Minn.
SNOW, CLYDE M., MR. AND MRS., Oak Park. Ill.
SNYDER, J. P., Norwich, N. Y.
SONDERN, C. W., MR. AND MRS., Cincinnati, Ohio.
SPRAGUE, CHARLES, Omaha, Nebr.
SPRAGUE, WM., Omaha, Nebr.
STANLEY, EMERSON D., MR. AND MRS., Madison, Wis.
STENSBY, A. E., Cambridge, Wis.
STEVENS, ASA N., Indianapolis, Ind.
STOCKING, C. H., Ann Arbor, Mich.
STRAUS, C. H., Calumet, Mich.
STROUD, HENRY J., JR., Pittsburgh, Pa.
STROUP, F. P., Philadelphia, Pa.
STUHR, ERNEST T., Corvallis, Ore.
SULTAN, FRED, St. Louis, Mo.
SWAIN, R. L., MR. AND MRS., Baltimore, Md.
SWAIN, R. L., JR., Baltimore, Md.
SWANSON, E. E., Indianapolis, Ind.

TAYLOR, F. O., Detroit, Mich.
TEETERS, W. J., Iowa City, Iowa.
TERRY, RALPH E., Elmhurst, Ill.

UHL, ARTHUR, Madison, Wis.

WAKEMAN, NELLIE, Madison, Wis.
WALTON, L. L., MR. AND MRS., Williamsport, Pa.
WEAVER, E. R., JR., Stillwater, Okla.
WEBSTER, G. L., Chicago, Ill.
WEISS, RICHARD G., MR. AND MRS., Madison, Wis.
WHEELER, C. B., Hudson, Mass.
WHITNEY, H. A. K., Ann Arbor, Mich.
WILEY, W. D., Philadelphia, Pa.
WILM, RAYMOND K., Milwaukee, Wis.
WILSON, ROBERT C., Athens, Ga.
WINNE, A. L. I., Richmond, Va.
WRUBLE, MILTON, Detroit, Mich.

YOUNGKEN, HEBER W., Boston, Mass.

ZOPF, L. C., Iowa City, Iowa.
ZUFALL, C. J., La Fayette, Ind.

A. PH. A. NOMINEES FOR 1934–1935.

For *President:* Robert P. Fischelis, Trenton, N. J.; J. W. Slocum, Indianola, Ia.; Gordon L. Curry, Louisville, Ky.

For *Vice-President:* George D. Beal, Pittsburgh, Pa.; C. Leonard O'Connell, Pittsburgh, Pa.; Edward Spease, Cleveland, Ohio.

For *Second Vice-President:* Oscar Rennebohm, Madison, Wis.; Mac Childs, El Dorado, Kas.; Roy B. Cook, Charleston, W. Va.

For *Members of the Council:* Ambrose Hunsberger, Philadelphia; S. L. Hilton, Washington, D. C.; H. A. B. Dunning, Baltimore; Edward Kraus, Ann Arbor, Mich.; John C. Krantz, Jr., Baltimore; W. Bruce Philip, Washington, D. C.; Thomas Roach, Oklahoma City, Okla.; E. N. Gathercoal, Chicago; R. C. Wilson, Athens, Ga.

SYMPOSIUM ON PRACTICING PROFESSIONAL PHARMACY.

Interesting exhibits of U. S. Pharmacopœia, National Formulary and A. PH. A. Recipe Book products and revision methods were prepared by the respective chairmen. These were further described in a symposium at the Second General Session of the ASSOCIATION.

PART I. MEETING THE PHARMACEUTICAL NEEDS OF THE PRACTICING PHYSICIAN.

The Foundations of Success for Professional Pharmacy, E. Fullerton Cook; Extending the Use of Official Products, E. N. Gathercoal; The Purpose and Influence of the "New and Non-official Remedies," The Value of the A. PH. A. Recipe Book, J. Leon Lascoff; The Growth of Professional Pharmacy, C. B. Jordan; Coöperation between Physicians and Pharmacists of the Northwest, George Bender; The Finds Concerning Professional Pharmacy in St. Louis, Frank A. Delgado; Pharmacology in the Medical Curriculum and the United States Pharmacopœia, John C. Krantz, Jr.; "Selling" Professional Service, Anton Hogstad, Jr.

PART II. THE HOSPITAL PHARMACY.

The Western Reserve University Plan for Hospital Pharmacies, Edward Spease; The Hospital Formulary, Robert A. Hatcher and Wendell J. Stainsby; The Benefits to a Hospital through Efficient Pharmaceutical Service, Harry E. Bischoff.

The exhibits and the symposium received the hearty approval of the membership and it is hoped that the chairmen will continue the plan at succeeding meetings and carry out such publicity at other state and national conventions.

STATE ASSOCIATION MEETINGS.

NEW HAMPSHIRE.

New Hampshire Pharmaceutical Association held its annual session at Rye Beach and carried out a very successful program. Many visitors were present and several delivered interesting addresses dealing with timely subjects, among them Congressman Charles W. Tobey.

The following officers were elected for the ensuing year: *President*, Leo L. Desparte, Lebanon; *First Vice-President*, George Moulton, Peterboro; *Second Vice-President*, William Ryan, Keene; *Third Vice-President*, Lawrence Cate, Rochester; *Secretary*, Rodney A. Griffin, Franklin; *Treasurer*, Edgar E. Goulet, Manchester; *Auditor*, Herbert E. Rice, Manchester; *Delegate to the N. A. R. D.*, Ernest L. Putnam, Concord.

The retiring president, E. L. Putnam, was presented with a handsome traveling case and Secretary Rodney A. Griffin with a desk lamp.

VERMONT.

Vermont Pharmaceutical Association met at Lake Bomoseen, June 25th–27th. Resolutions were passed, suggesting that all national associations, of the drug industries, devise and adopt a constructive measure as a substitute for existing Federal and State special and ruinous and commodity taxes for presentation to Congress and to State legislatures. The following officers were elected for the ensuing year: *President*, Laurence W. Leonard, Randolph; *First Vice-President*, H. E. Colman, Barre; *Second Vice-President*, George E. Donovan, Fair Haven; *Third Vice-President*, J. W. Blakely, Montpelier; *Secretary-Treasurer*, Welcome B. Eastman, St. Johnsbury.

WASHINGTON.

Washington Pharmaceutical Association held its annual convention at Sunrise Lodge on Mt. Rainier, June 26th to 28th. The following officers were elected: *President*, F. R. Robertson, Spokane; *Secretary*, Harry W. Ayres, Seattle; *Treasurer*, Graham A. Condie, Seattle; *District Governors*, Charles Graham, Bellingham; Stanton Hall, Everett; Guy C. Norton, Tacoma; Carlton Sears, Olympia; George Sears, Chehalis; Dayton Garrison, Centralia; Jerry Patton, Longview; R. W. Reder, Vancouver; William Desmond, Aberdeen; Earl Brown, Bremerton; Murray Brown, Yakima; N. B. Krause, Walla Walla; Ray Price, Spokane; William Gray, Wilbur; J. E. Brayton, Sequim.

Discussion and adoption of an NRA code was an outstanding part of the program; Prof. E. V. Lynn was one of the speakers of the convention.

THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

Representatives of the National Association of Retail Druggists met with the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION in Madison. As usual and expected the fraternal and coöperative spirit to serve pharmacy prevailed during these deliberations. The A. PH. A. is represented at the meeting of the N. A. R. D., in Chicago, by delegates including President R. L. Swain and former presidents of the ASSOCIATION. At this writing the sessions of the N. A. R. D. convention have not opened, so this is a greeting accompanied by wishes for a successful meeting. Indications are for a large attendance.

ANNUAL MEETING OF THE AMERICAN PHARMACISTS ASSOCIATION, INC.

The keynote of the convention was the establishment of closer relations between physicians and pharmacists of Northern California. Among the speakers of the medical profession were Dr. Langley Porter, dean of the University of California Medical School; Dr. Harold Fraser, of the San Francisco County Medical Society, and Dr. Samuel Goldman, member of the San Francisco Health Council. The pharmacists were represented by a number of outstanding members; among them, Leo Mattes, president of the California Board of Pharmacy; George Harrison Frates, former president of the California Pharmaceutical Association; President Waldemar Gnerich, of the California Northern Retail Druggists Association; Professor Frank T. Green; Congresswoman Florence P. Kahn; President Edna Gleason of the California Pharmaceutical Association; John Culley; Dr. T. C. Daniels, of the College of Pharmacy; Dr. W. C. Flemming, of the College of Dentistry.

A Pan-Pacific Conference of pharmacists is planned and it was voted to establish an honorary group to be known as the American College of Apothecaries.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

In a special bulletin designated as the "Hoosier Listening Post," Carl F. G. Meyer, president of the National Wholesale Druggists' Association, presents a message to the membership urging all to make every endeavor to attend the Association's annual convention which will be held at French Lick Springs, Ind., October 1 to 5, inclusive. President Meyer pointed out that there will be many subjects vital to the drug industry discussed at the meeting.

FEDERAL WHOLESALE DRUGGISTS' ASSOCIATION.

Containing a large number of special papers by individuals and reports from committees on a wide variety of subjects of importance to the Association in particular and to the drug trade generally, the program for the eighteenth annual convention of the Federal Wholesale Druggists' Association has been completed and made public by Secretary R. E. L. Williamson, of Baltimore. The meeting, which will be held September 25th, 26th and 27th at the Stevens Hotel, Chicago, will have morning and afternoon business sessions on Monday and Tuesday, with the annual banquet on Tuesday.

BOOK NOTICES AND REVIEWS.

Urine and Urinalysis. By LOUIS GERSHENFELD, Ph.M., B.Sc., P.D., Professor of Bacteriology and Hygiene and Director of the Bacteriological and Clinical Chemistry Laboratories at the Philadelphia College of Pharmacy and Science. Fabrikoid. Price $2.75. Pages 272, with 36 illustrations. Philadelphia: Lea & Febiger, 1933.

The author states in the preface that the book is intended for those who do not wish to invest in more elaborate and expensive texts in physiological chemistry. Although it is true that most of the material found in this text can be obtained in the more comprehensive texts, the present work offers some advantages. The treatment of each laboratory test indicates that the author has had considerable personal experience with the material under consideration. The section concerned with the qualitative tests is especially good. The usual as well as the unusual urinary constituents are carefully considered.

The sections devoted to the microscopic examination of urinary sediments contain practically the same material that is to be found in the standard texts of clinical laboratory methods. The standard procedures for the study of kidney function are well described.

On the whole, much valuable information on urine is brought together in this one small volume.—A. A. CHRISTMAN.

Recent Developments in the Preparation and Use of Thallium is the subject of an exceptionally informative and important contribution on this relatively little known and rather scarce mineral, which paper appears in the June issue of "Foote-Prints," the house magazine of the Foote Mineral Company, Philadelphia. The article is by Dr. James C. Munch, an authority on thallium, and one of the first to introduce thallium compounds into rodenticidal use. Numerous photographs illustrate the article, which contains a wealth of data as to the history of thallium, together with discussions of its technical, natural and its scientific uses. Copies of the issue containing the article may be had by addressing the Foote Mineral Company, Sixteenth and Summer Streets, Philadelphia.

CODE PRICE CONTROL PROVISIONS.

Deputy Administrator Whiteside, on September 20th, presented the Retail Code to General Johnson for his consideration and it has been given to the Press. The drug code would be handled by a Retail Drug Trade authority, to be provided, in which the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists are represented and other associations to be designated by the NRA.

In addition to the trade practices set forth in Article IX, all drug retailers shall comply with the following:

(*a*) No drug retailer shall substitute another article or any part thereof for the kind ordered, without due notice to and consent of the customer.

(*b*) No drug retailer shall advertise to fill prescriptions at a uniform price irrespective of cost of ingredients or quantity prescribed.

(*c*) No drug retailer shall permit any demonstrator or sales employee, whose salary is wholly or partially paid by a manufacturer or distributer, to work in his establishment unless such demonstrator or sales employee is clearly and openly identified as the agent of such manufacturer or distributer.